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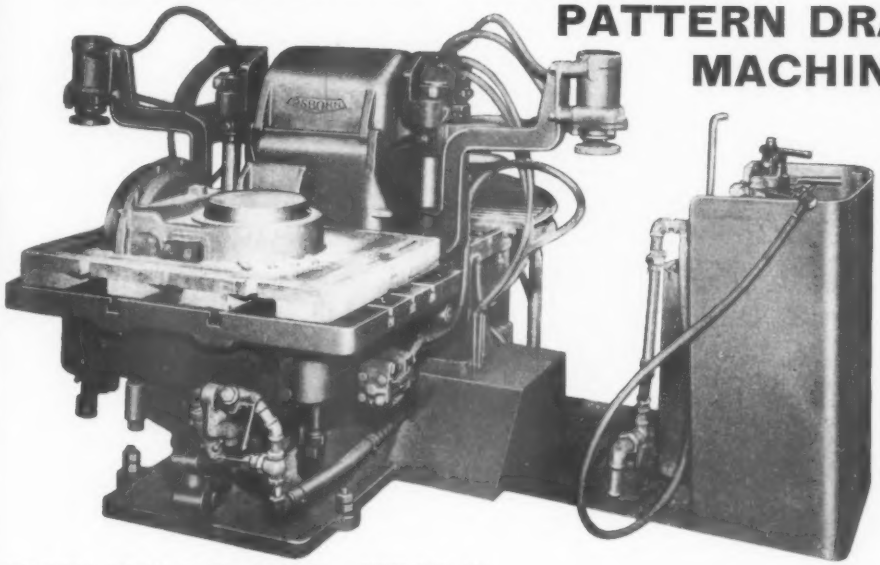
OSBORN JOLT ROCK-OVER PATTERN DRAW MACHINES



OSBORN ROCK-OVER JOLTER. SIZE 242. W.

	242 W. M/C	643 M/C
MAX. BOX DIMENSIONS OVERALL :—		
LENGTH	OPEN END	OPEN END
WIDTH	30″	38″
JOLT CAPACITY	1500 lbs.	2000 lbs.
TABLE SIZE	29″ × 42″	35″ × 50″
DRAW STROKE UP TO	19″	21″
COMBINED BOX SPACE & PATTERN DRAW	31″	33″

PNEUMATIC CLAMPS OPERATE IN TANDEM

OPEN ENDS PERMIT WIDE VARIATION OF BOX LENGTH

AIR CLAMPS LOCK LEVELLING MECHANISM WHICH TAKES CARE OF VARIATIONS IN BOTTOM BOARDS

AIR CONTROLLED PATTERN DRAW GIVES SLOW & FAST DRAW

CONVEYOR ROLLER ON LEVELLING MECHANISM CAN BE ARRANGED FOR ROLL-OUTS EITHER ON CENTRE LINE OF MACHINE OR AT RIGHT ANGLES

'T' SLOTS ARE PROVIDED IN TABLE FOR QUICK PATTERN CHANGE

J. W. JACKMAN & COMPANY LIMITED

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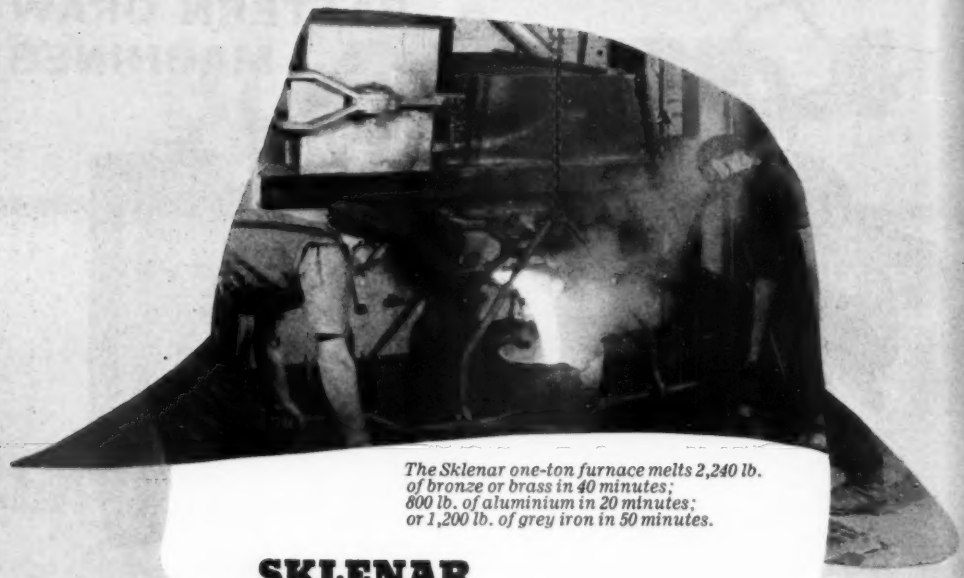
for SKLENAR—the casting vote!



The Sklenar one-ton furnace melts 2,240 lb. of bronze or brass in 40 minutes; 800 lb. of aluminium in 20 minutes; or 1,200 lb. of grey iron in 50 minutes.

SKLENAR

furnaces for general duties in the foundry.

VERSATILITY...

SKLENAR furnaces melt light alloys, brasses, bronzes, and grey iron in sequence with no risk of contamination.

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SKLENAR furnaces give quick melts (500 lb. brass in 35 minutes) with low metal losses (maximum under 2 per cent.). Finger-tip control of atmosphere for melting non-ferrous metals is standard.

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SKLENAR oil or gas fired furnaces save fuel (0·008 gallon of fuel oil or 4 cubic feet of gas per lb. of metal are typical). No crucibles to renew—no spares to worry about.

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AND
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AND
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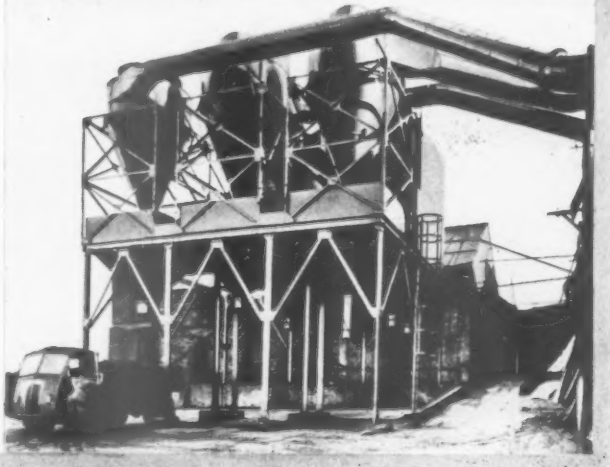
CHARGES...



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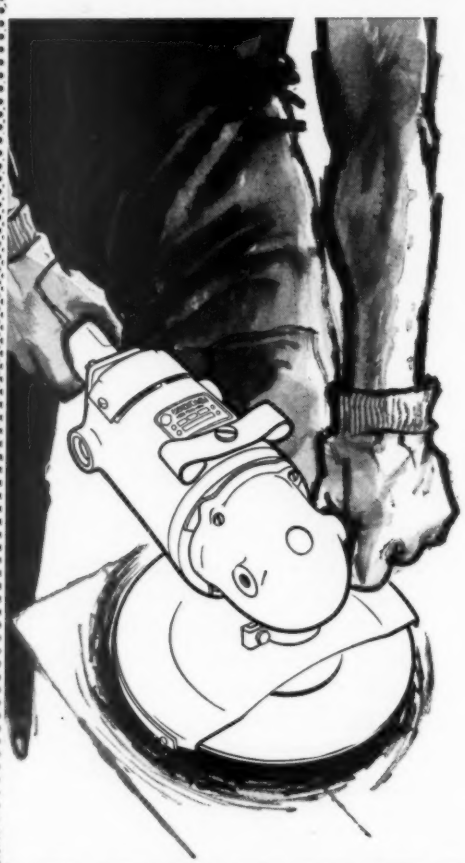
Black & Decker

A Grinder with Guts



For years W. Flanagan & Son of Liverpool searched for a portable grinder capable of standing up to continuous heavy duty work in their sheet metal shop.

Black & Decker provided the complete answer with their new Heavy Duty Angle Grinder. Here, at last, is "A grinder with guts" taking every heavy duty grinding operation in its stride. Long after former machines would have broken down, Black & Decker Grinders are still on the job. Service costs are slashed to a minimum, needless production delays eliminated.

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Black & Decker's confidence in their new Angle Grinder is backed-up by this positive guarantee of quality and performance. Nc other electric tool manufacturer can match this unique offer.

DEPRESSED CENTRE DISCS. Speed weld dressing —speed edge preparation for welding—speed grinding off flame cut edges.

CUT OFF WHEELS. For removing casting risers —cutting off angle iron, bolts, steel rods, etc.

Attachments also available for wire brushing, sanding, planing.

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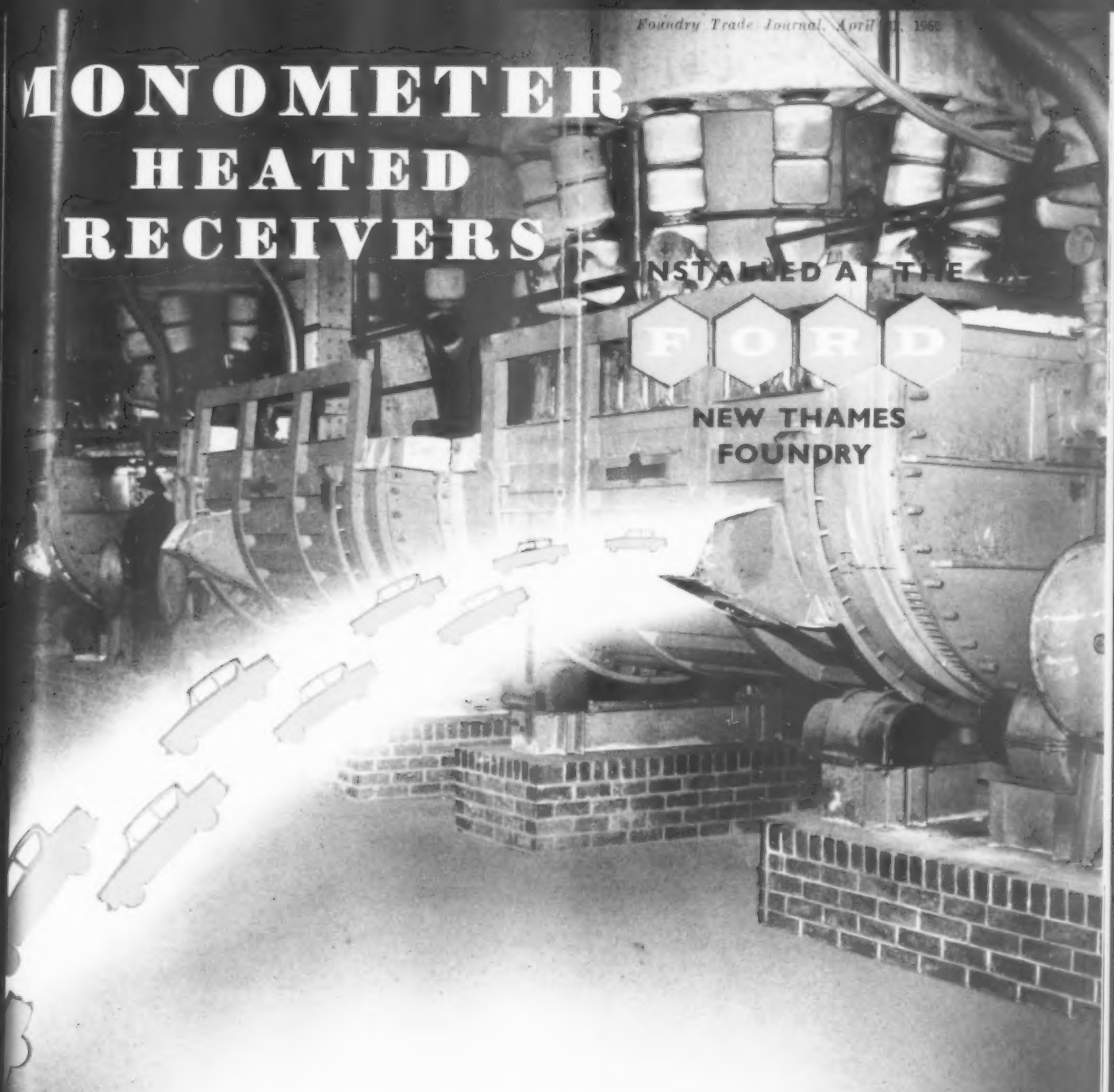
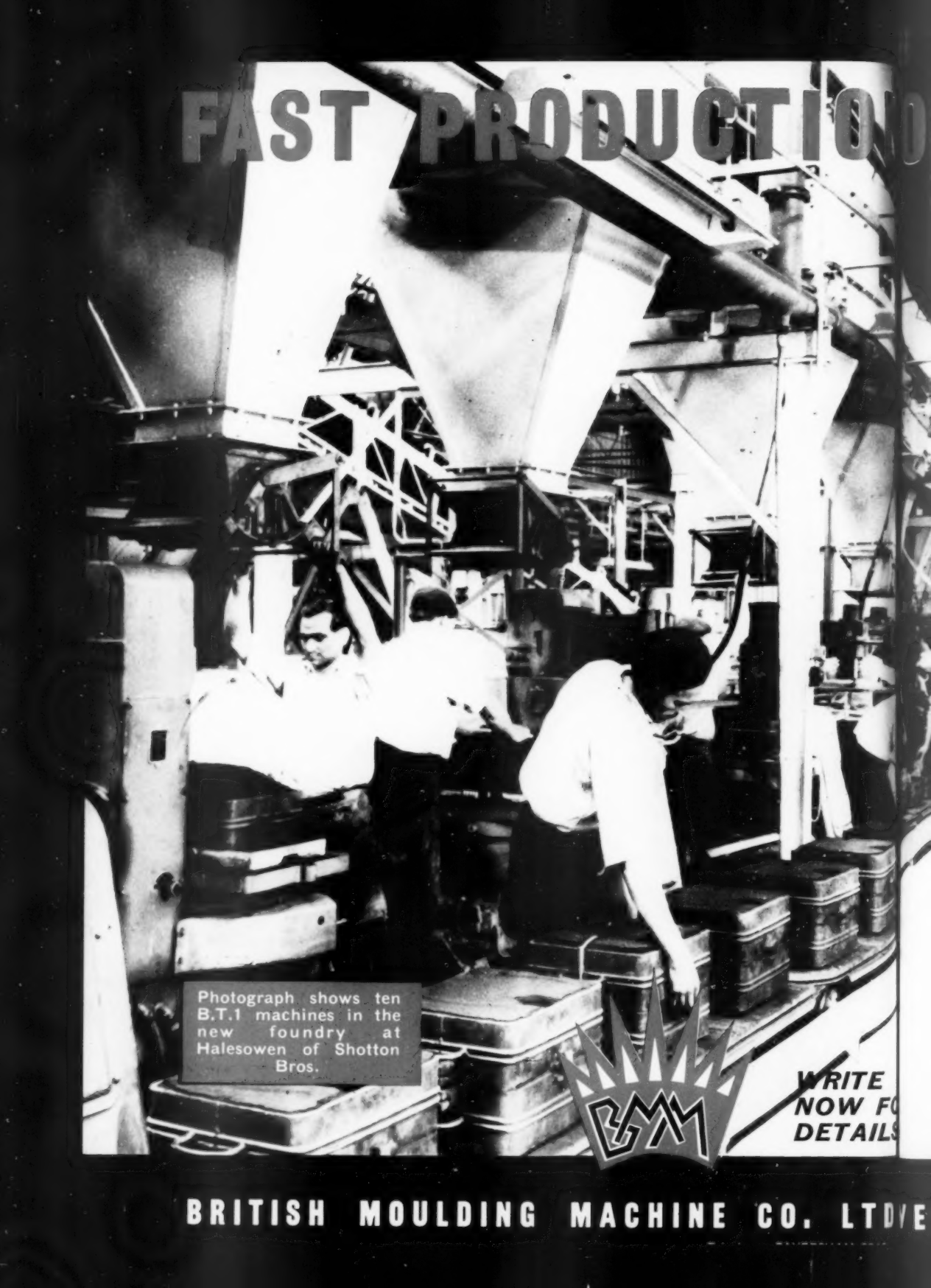


Installation of four 8-Ton Hot-metal Receivers supplying molten iron to the casting bay at Ford's new Thames Foundry. Castings for the **NEW FORD Anglia** are produced from metal at temperatures as tapped from the cupolas.

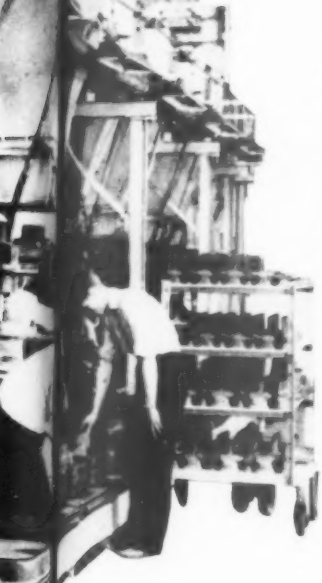
Receivers may be fired by oil or gas and are available in a wide range of capacities, with motorised or manually-operated tilting.

MONOMETER MANUFACTURING CO. LTD.,
SAVOY HOUSE, 115-116 STRAND, W.C.2. Tel: TEMPLE BAR 9025


FAST PRODUCTIO
Photograph shows ten B.T.1 machines in the new foundry at Halesowen of Shotton Bros.
WRITE NOW FO DETAILS
BRITISH MOULDING MACHINE CO. LTD/E

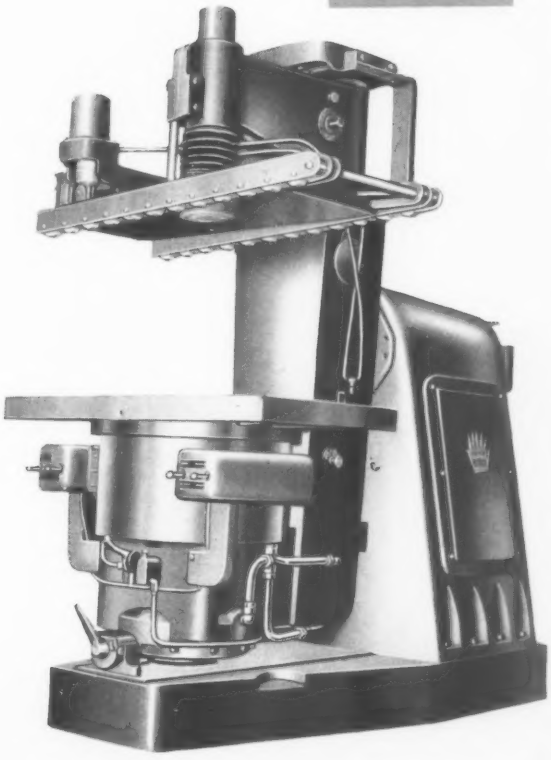
TURNOVER MACHINES

Turnover type moulding machines are no longer slow and our newest models are working a 30 second cycle in many production foundries at home and abroad.



AUTOMATIC JOLT TIMER
Instantly variable for the required number of jolts.
One of many fully patented features is the AUTOMATIC ANVIL which ensures a solid jolt and a fast and unimpeded turnover.

BT5



All models are available with manually or power operated swing arm and various methods of —
AUTOMATIC MOULD REMOVAL
at the front or the side, on rollers or "rails".

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CON - BELT

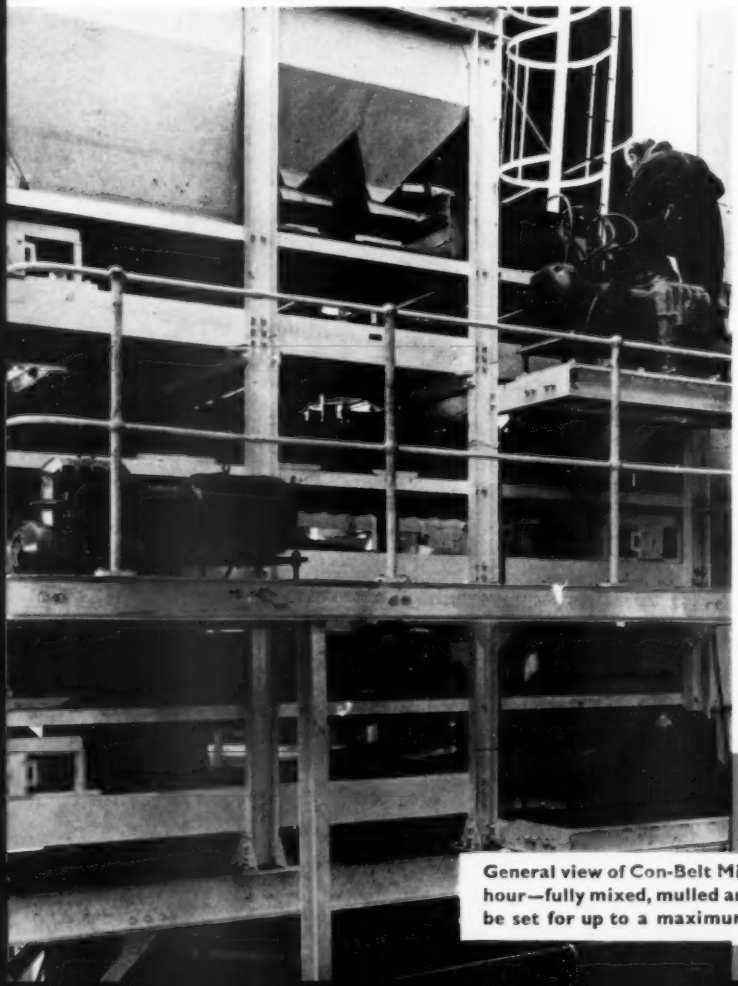
CONTINUOUS CONVEYOR BELT SAND MILL

New, Revolutionary Design applies F.E.'s Proved Mulling Principles, and gives sand preparation processes in one compact unit.

Each Unit Engineered to suit the application.

Available in three standard sizes

C.B.M 60/90, C.B.M. 100/150, C.B.M. 150/225.



ADDITIONS

ATOMIZED MOISTURE

MIXING

MULLING

AERATION

DISINTEGRATION

COOLING

Mail us for leaflet 155

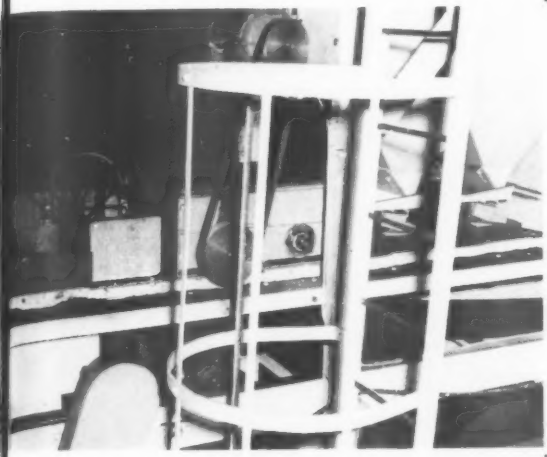
This is the only M[illegible]esig

WORLD PATENT APPLICATIONS PENDING

General view of Con-Belt Mill handling 60 tons of sand per hour—fully mixed, mulled and aerated (this same Mill can be set for up to a maximum of 90 t.p.h.)—for grey iron.

MILL

...60 t.p.h. Con-Belt Mill top mixing belt deck, ...tions hoppers, 'first Disintegrator Mixer and water ...tion' and two mixing and mulling belt decks, each ...erator unit.



Close up of top deck showing bond material and coal dust hoppers with vibratory feeders in front of main feeding and regulating hopper; first Disintegrator Mixer and adjustable air pressurized atomizer for intensive distribution of moisture.

...ing and roller assembly on first and second mixing ... mulling belt decks. All muller rollers power ...en at a different speed to conveyor belts. Muller ...rs cover full effective belt width and are free to ...and fall. Vertical divertors and ploughs between ... pair of muller rollers.

Mi...esigned for high outputs—up to 500 tons per hour!

FE
FOR FOUNDRY EFFICIENCY

FOUNDRY EQUIPMENT LTD

LEIGHTON BUZZARD, BEDFORDSHIRE, ENGLAN

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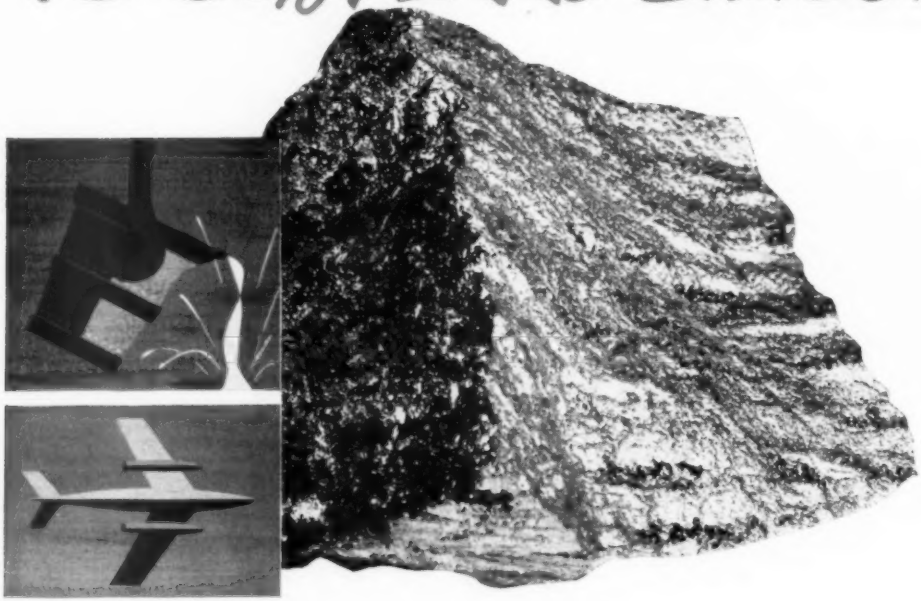
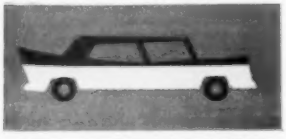
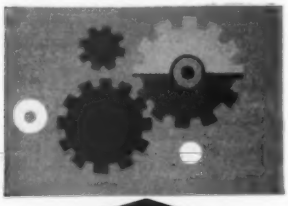
LEIGHTON BUZZARD 2441 (5 lines)

TELEGRAMS:
'EQUIPMENT' LEIGHTON BUZZAR

45-50% FERRO SILICON







UNION CARBIDE
TRADE MARK

ALLOYS DIVISION

Consistent high quality

ST. LAWRENCE lumpy ferro silicon, containing 45-50% silicon, is a clean alloy, produced by electrothermal reduction, which withstands normal storage without deterioration. The exacting physical requirements imposed by steel users make it necessary for steel producers to use only the best available alloy. ST. LAWRENCE 45-50% grade is preferred because of its uniformity in chemical composition and because of its high density, convenient size and freedom from impurities.

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Adequate stocks are always maintained at points in the United Kingdom to provide prompt delivery.

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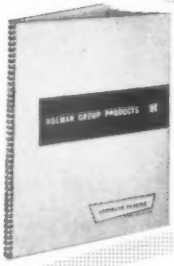

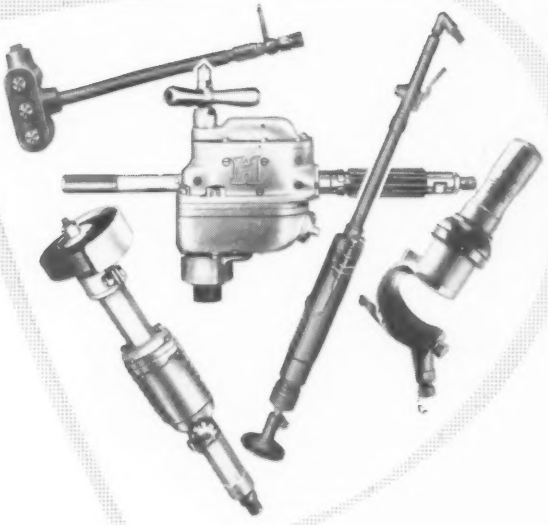

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Now what's the best tool for *this* job, you ask. Pneumatic? Yes. Holman? Undoubtedly. Ah, but do Holman *make* it?

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The most reliable in the world.

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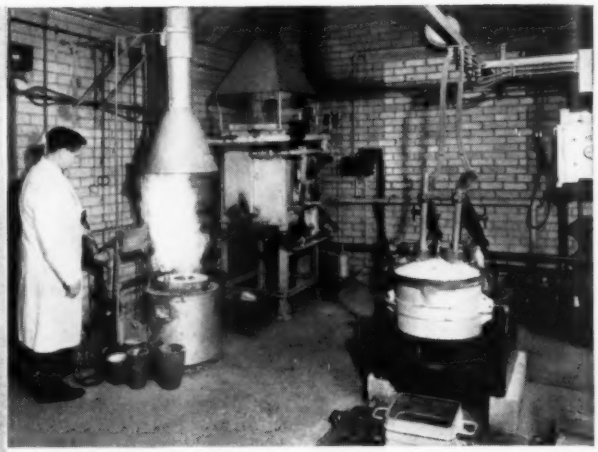
HM16

Finding the answer to your problem



If you should be faced with a technical problem in connection with casting defects in foundry sands, you are invited to call on the facilities of our experimental foundry and sand testing laboratory. In addition, our foundry technicians will be pleased to visit any foundry man who might wish to discuss a particular difficulty on the spot.
These 'Fulbond' services are offered without charge and are, of course, entirely confidential.
If you will kindly telephone or write to us, we shall be very pleased to co-operate in finding the answer to your problem.

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THE FULLERS' EARTH UNION LTD.

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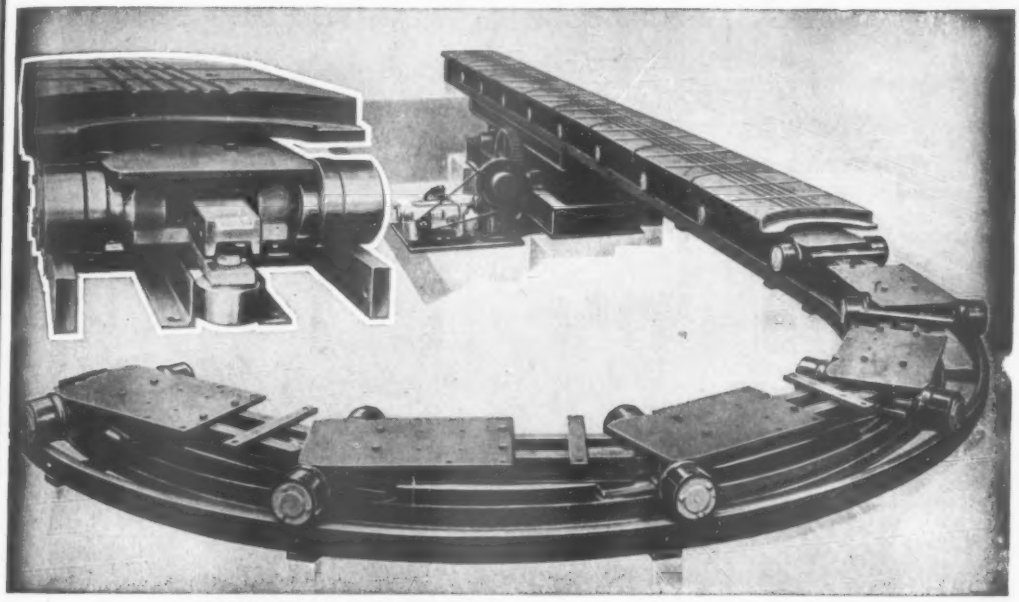
Telephone Redhill 3521

CMF 44A

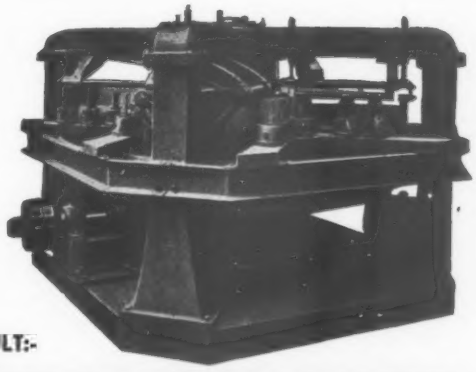
FOUMEC

MOULD CONVEYOR.

PLANTS



TYPICAL MOULD CONVEYOR SHOWING SOME C.I. PLATES REMOVED, ALSO DETAILS OF AXLES. SIZES TO REQUIREMENTS



THESE SAND MILLS, S. B. TYPE (SUPER BAILLOT) CONTINUOUS OR SEMI-CONTINUOUS ARE MADE FOR OUTPUTS FROM 1 to 30 TONS OF SAND PER HOUR. — THEY ARE THE HEART OF MECHANISED UNITS.

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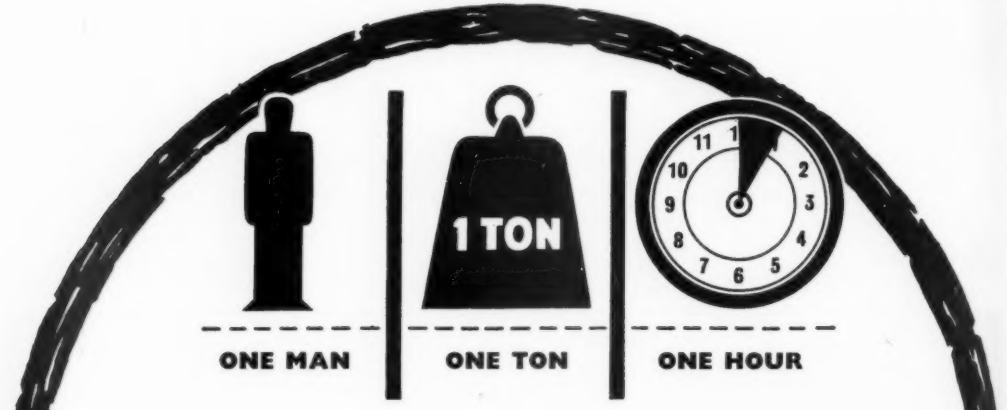

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The Centriblast Airless Rotary Barrel is still unsurpassed for speed and economy in cleaning all types of castings, forgings and fabrications within the limit of its capacity.

May we send you details of our full range of Compressed Air Operated and Airless Blast Cleaning Plant?

CENTRIBLAST

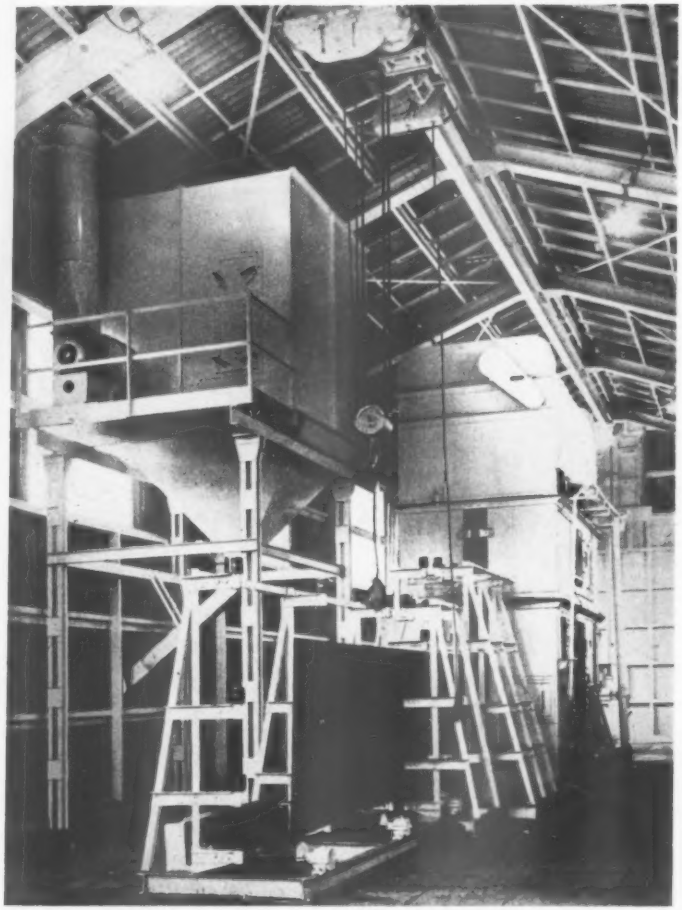
36 in. x 42 in. Airless Rotary Barrel Shot Blast Machine.

SPENCER & HALSTEAD LIMITED

BRIDGE WORKS · OSSETT · YORKSHIRE TEL OSSETT 821-4 GRAMS SPENSTEAD

V & S SHOT BLAST EQUIPMENT

WE ILLUSTRATE A RECENT INSTALLATION FOR THE DE-SCALING OF STEEL PLATES 45'0" LONG BY 12'0" WIDE



This demonstrates the scope and versatility of our experience of shotblasting problems.

All over the World our equipment is satisfactorily dealing with abrasive cleaning problems in plants ranging from small shot blast cabinets to special purpose applications such as this.

We are Experts in this field. Our Know-How is at your service.

Sole Agents in the United Kingdom for the full range of Vogel & Schemmann Equipment.

FOR ALL SHOT BLASTING PROBLEMS CONSULT:—

METALS & EQUIPMENT (W'TON) LTD.,

DRAYTON ST., WOLVERHAMPTON.

TEL. WOLVERHAMPTON 23581. TELEGRAMS: METAQUIP.

trouble-free bunker discharge

The primitive, inefficient method commonly used for clearing material which sticks in a storage bunker is by applying a sledge hammer to the side of the hopper. This is a form of low frequency, uncontrolled vibration. When vibration is applied at the *correct* frequency, the *correct* amplitude and the *correct* point of application, almost any material can be satisfactorily discharged.

SINEX has the experience with a wide variety of materials and a wide range of hopper designs to recommend how vibration should be applied effectively to solve *your* particular problem.

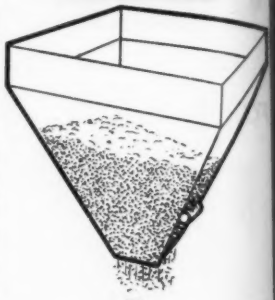
The three examples illustrated show three different combinations which are typical of many applications, but even these, whilst using the same type of unit, can only be effective if the types of unit themselves are placed in the correct position and have the correct frequencies and amplitudes of vibration, to suit the characteristics of the material to be discharged.

It would pay you, therefore, to make use of our experience and to consult us on your particular problem.

Send for relevant details and information sheet.

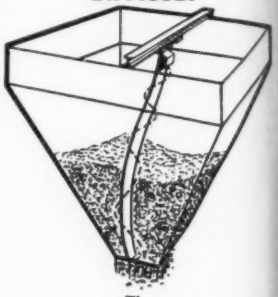
These are some of the many materials which we have handled satisfactorily and ensured trouble-free bunker discharge: Pulversized and small coal, iron-ore, coke, lime, flour, grain, grist, foundry sand, soda ash, cullet, sand, gravel, granite chips and all road stone materials.

LESS-DIFFICULT



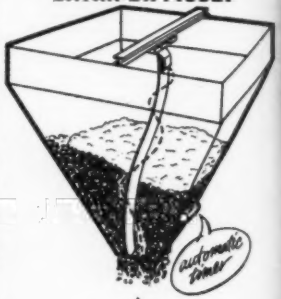
The installation of an external vibrator to a steel hopper.

DIFFICULT



The vibrating reed for application where external vibration is impractical due to structural or other difficulties and if the bunker is made of concrete.

EXTRA-DIFFICULT



A combination of internal and external bunker vibration. Where the external vibrator is timed for 'on and off', the vibration frequency, on slowing down, goes through the natural resonance of the bunker, irrespective of load material contained.

Sinex

Bunker clearance Equipment

SINEX ENGINEERING COMPANY LIMITED, CENTRAL WAY, NORTH FELTHAM TRADING ESTATE, FELTHAM, MIDDLESEX

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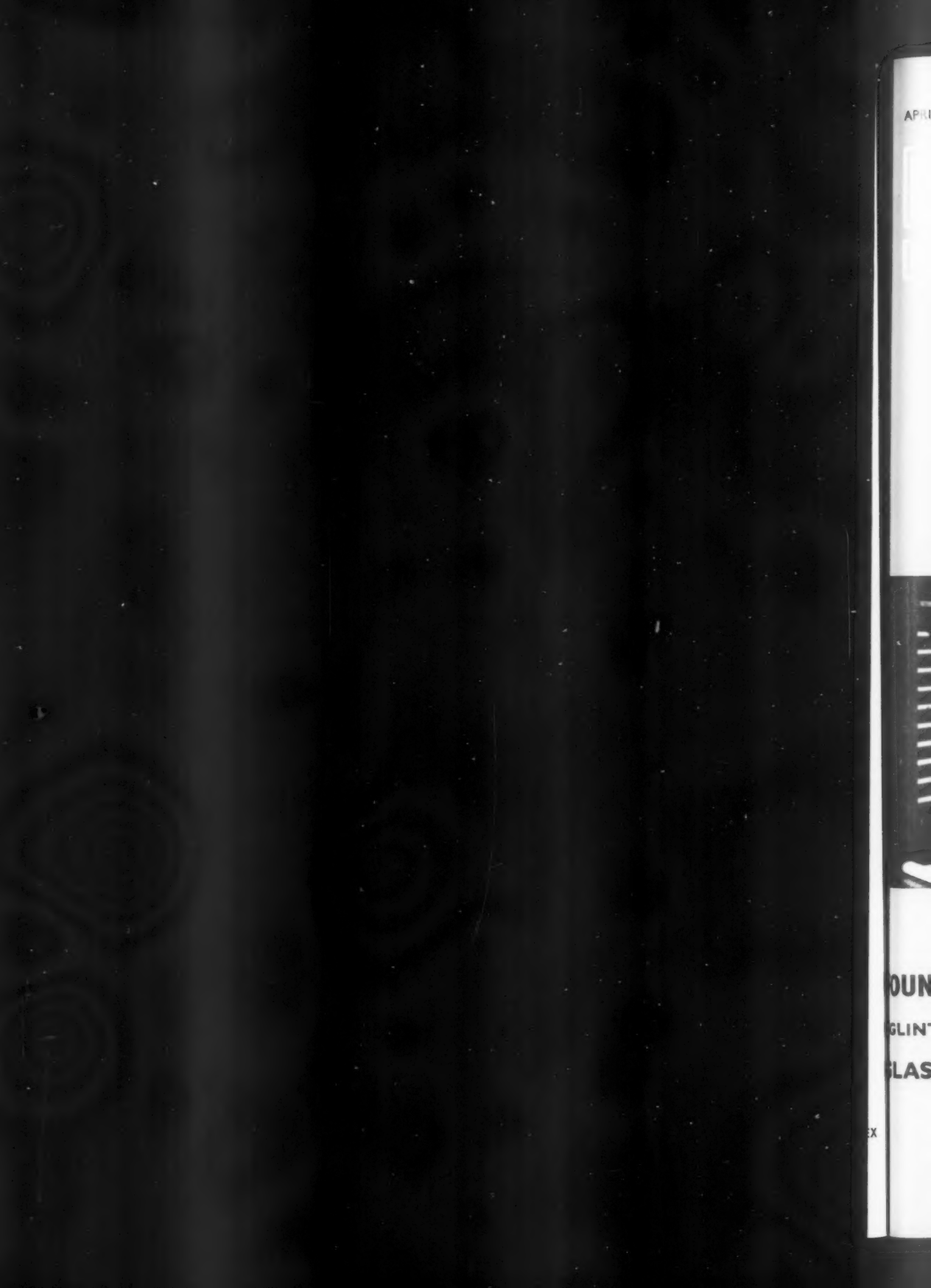

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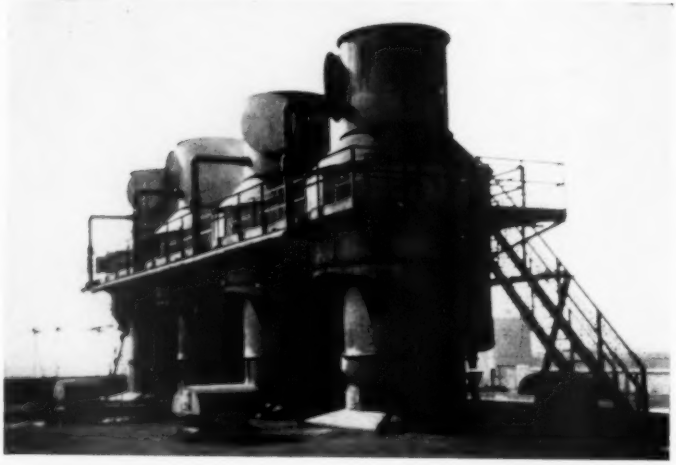

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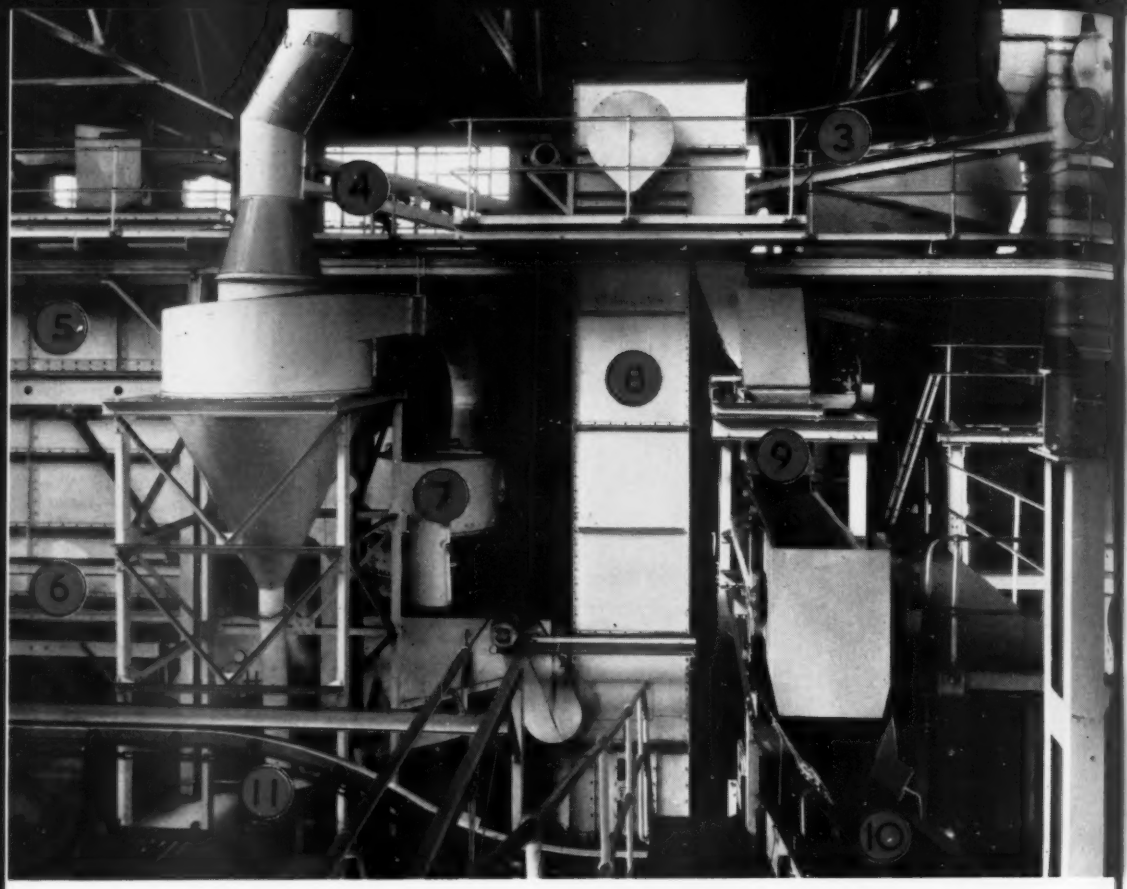

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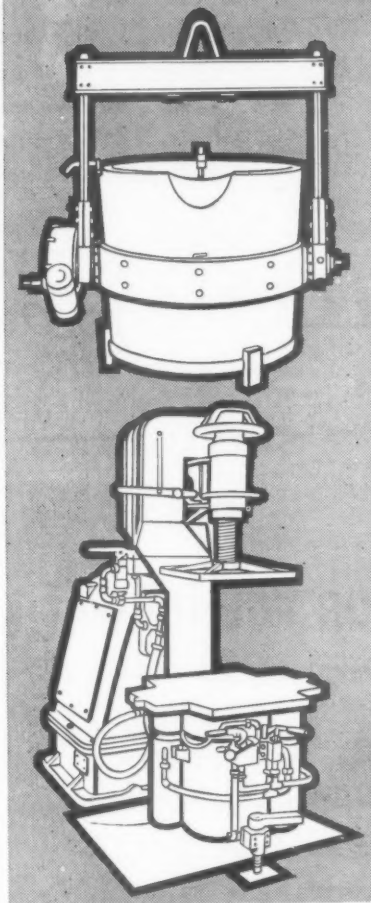

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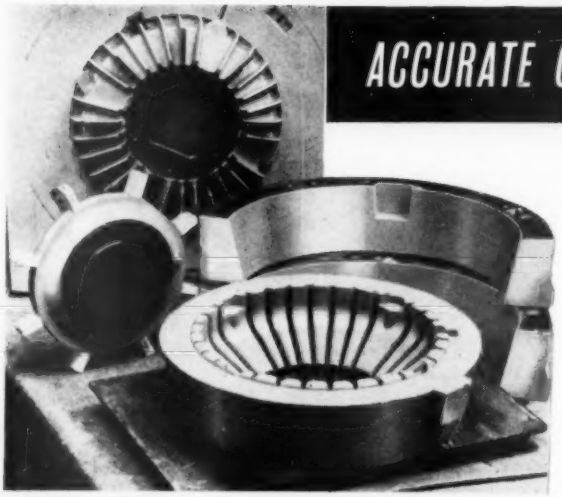

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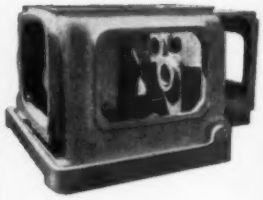

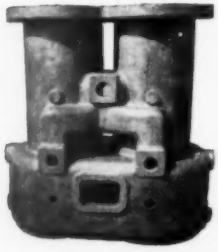

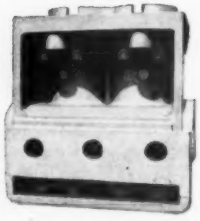

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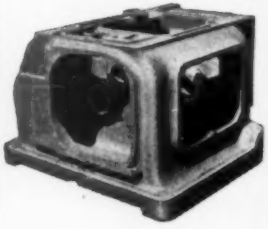

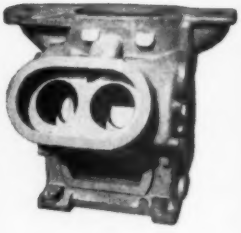

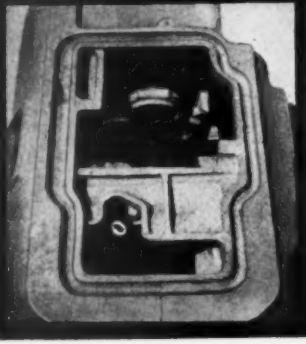

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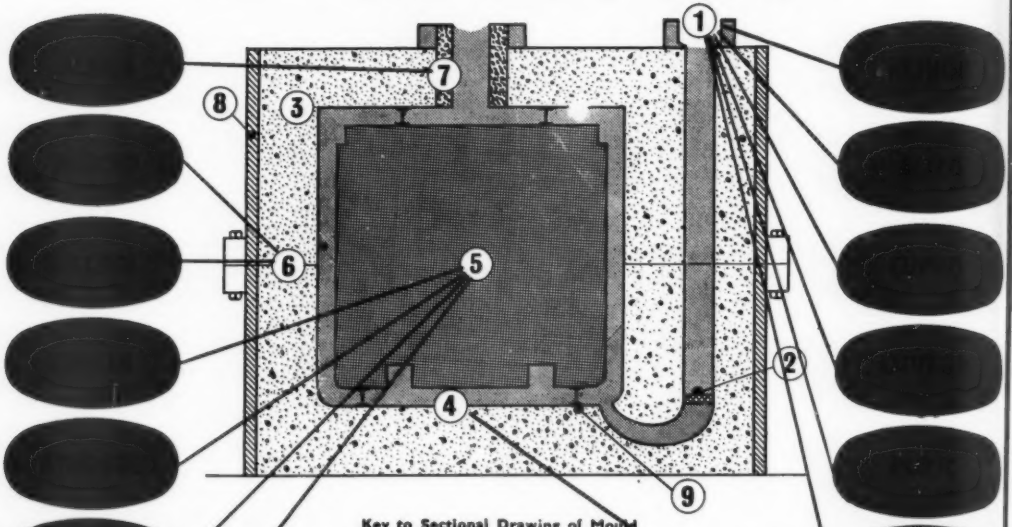

Key to Sectional Drawing of Mould

		Sand for booklet No.
1	Metallurgical Control use of Fluxes.	3
2	Clean Metal by using Ceramic Strainer Cores and Discs.	4
3	Coal Dust additional to Facing and Backing Sand.	1
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5	Cores using Crulin and Crudol Core Binders (Oil Bonded, Air Setting Cereal or CO.2 Binders).	2
6	Moulds Parted with Beecro Silica Free Parting Powder or Beecrol Parting Liquid.	1
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8	Moulding Boxes supplied by B.F.U.	
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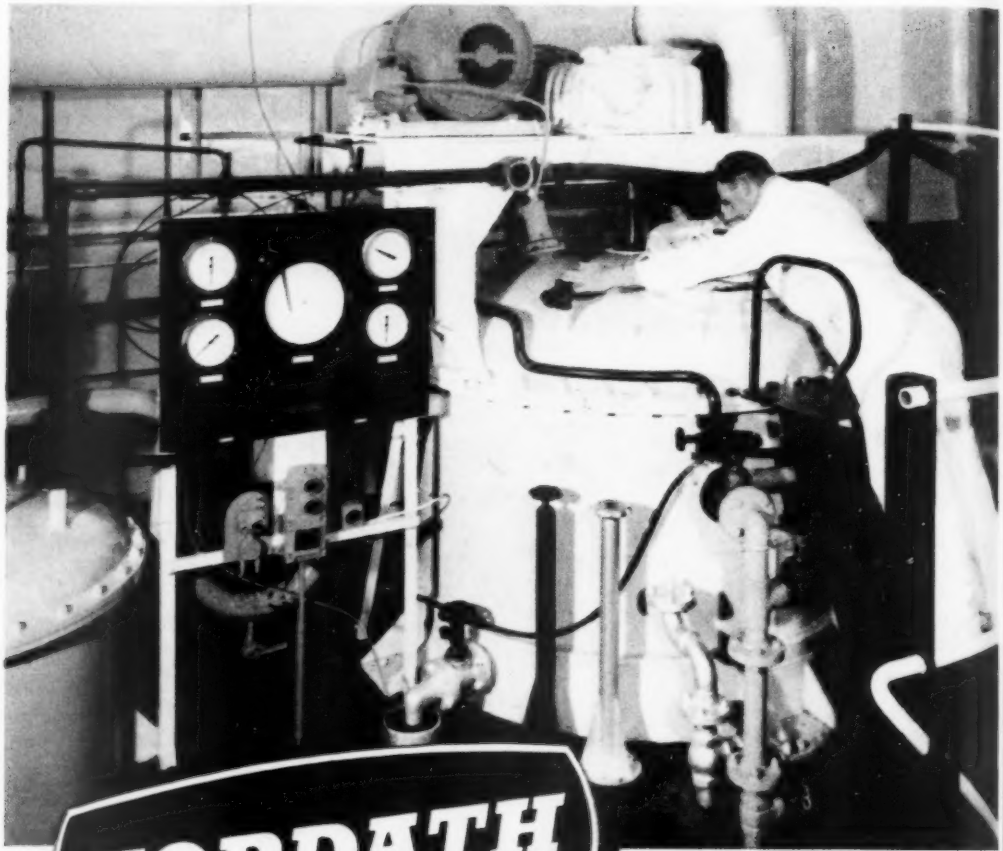

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FOUNDRY
TRADE JOURNAL

Vol. 108 April 21, 1960 No. 2263

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FOUNDRY
TRADE JOURNAL
Vol. 108 April 21, 1960 No. 2263

Accident Prevention

The current casualty list from industrial accidents in iron foundries came in for study at the recent Ironfounding Health and Safety Conference organized by the Council of Ironfoundry Associations. As a result, it was felt that close attention should be given to the 67 per cent. of industrial accidents which fall into three categories—those arising from handling of goods, persons falling, and persons being struck by falling bodies. No precise legislation can be formulated and directed towards reduction of accidents from these causes, let alone their eradication. The problem can only be resolved by continuous effort by enthusiastic people with a devotion to the reduction of human suffering and the loss of efficiency consequent upon it. Obviously, this enthusiasm must be generated in the boardroom and permeate the whole organization.

It is good to report that the foundry industry's campaign for accident prevention is wholeheartedly supported by its major trade union. It gives no satisfaction to the trade union to take up cases for compensation for industrial accidents, as obviously it is in their major interest to help in their reduction and prevention. As with the employers, the enthusiasm of the union executive should filter down and permeate the ranks.

Whilst good progress has been made during the last decade in the reduction of industrial accidents in which the foundry industry has shared, there is no room for complacency and eternal vigilance must be the watchword. We are convinced that regular inspection of the foundry and the presentation to the board of directors of a report based on the form emanating from the Gray Iron Founders' Society (America)—which was recently reprinted in the JOURNAL—could be a major factor in the reduction of accidents. At the very least, such a report gives the board of the company the assurance that the matter of industrial accidents is receiving intelligent and systematic consideration. Again, the fact that the works staff know that regular inspections are taking place draws continuous attention to the great contribution they can be making. Under such surveillance, the question of "tiger-striping" of dangerous projections and use of other conventional markings would get immediate attention and not just the conventional attitude of "will receive attention." Safety precautions—in addition to the humanitarian aspect—have a commercial significance of a high order and should command the deep interest of the board and management.

French Foundry Congress

The 33rd Congress of the *Association Technique de Fonderie*, the French foundry technical association, is to be held in Bordeaux from June 26 to 28, just before the closing of the International Fair which is being held in that city. The following programme is scheduled.

June 26. Joint excursion of visitors and local foundrymen to Arcachon, and visit to the International Fair in Bordeaux.

June 27. Technical sessions, with Congress dinner in the evening.

June 28. Visit to the Fumel works of the Société Minière et Métallurgique du Périgord—one of the most outstanding foundries in France.

During the afternoon of June 27, a special programme has been arranged for the ladies, which includes a visit to the Château de la Brède.

Technical Contributions

The following papers are to be presented:—"Reduction of Gas Consumption in the CO_2 Process," by Mr. Jeancolas and Mr. Virolle; "Practical Significance of the High Damping-capacity of Cast Iron," by Mrs. Plénard; "Austenitic Grain-size in Steel Castings," by Mr. Détrez; "Cooling of Metal in Ladles," by Mr. Decrop and Mr. Aymard; "Incorporation of Various Elements, particularly Carbon, in Cast Iron," by Mr. Volianik, and "Metallurgical Study of Thin-section Iron Castings intended for Enamelling, including Foundry Practice and Heat-treatment," by Mr. Détrez.

Forthcoming Events

APRIL 26

Institution of Plant Engineers

South Wales: "Heating and Air Treatment in Industry," by A. A. Field, 7.30 p.m., at the South Wales Engineers' Institute, Park Place, Cardiff.

Society of Instrument Technology

Control section: Annual general meeting followed by "Some Recent Advances in Industrial Electrical-control Techniques," by A. E. Adams, 7 p.m., at Manson House, 25, Portland Place, London, W.1.

Combustion Engineering Association

Whole-day meeting at the Douglas Hotel, Galashiels. 10.30 a.m.: Films relating to oil firing—"Atomization" and "Clean Air Act"—followed by discussion on "Modern Methods of Oil Firing," opened by R. A. Dunlop. 2 p.m.: Discussion on the "Utilization of Small Coals," opened by R. Cleland.

North Western region: "Working of the Clean Air Act over the Past Twelve Months," by J. E. Richards, preceded by film "The Clean Air Act" by courtesy of Shell-Mex and B.P., Limited, 2.30 p.m., at the Engineers' Club, Manchester.

Institution of Industrial Safety Officers

Second Alexander Redgrave Memorial Lecture by Mr. A. G. Palmer on "Design and Use of Clearance Certificate Systems," 2.30 p.m., at the Royal Society of Arts, John Adam Street, Adelphi, London, W.C.2.

APRIL 27

Institute of British Foundrymen

Southampton section: Annual general meeting followed by lecture and film on "Dust Extraction and Dressing," by W. B. Lawrie, M.B.E., M.SC., 7.30 p.m., at the Technical College, St. Mary's Street.

London branch: Annual general meeting followed by "Foundry Coke—Production and Utilization," by J. P. Graham, assisted by L. W. Bolton, 7 p.m., at the Constitutional Club, Northumberland Avenue, W.C.2.

Birmingham branch: Annual general meeting followed by "Quality in Copper-base-alloy Sand-castings," by T. Hudson, 7.15 p.m., at the James Watt Memorial Institute, Great Charles Street.

APRIL 28

Institute of British Foundrymen

East Anglian section: Visit to the Suffolk Iron Foundry (1920), Limited, Stowmarket, commencing 2 p.m.

APRIL 29

Institute of Vitreous Enamellers

Southern section: Annual social evening comprising dinner at the Connaught Rooms, Great Queen Street, London, W.C.2, 6 for 6.30 p.m., followed by a visit to the Cinerama presentation of a "South Seas Adventure."

APRIL 30

Institute of British Foundrymen

Lancashire branch: Annual general meeting; John Wilkinson Memorial Medal presentation and reading of winning paper, followed by a review of the work of the technical committee by G. Southern, 3 p.m., at the Midland Hotel, Manchester.

Slough section: Visit by coach to London to see "South Seas Adventure," a Cinerama presentation, followed by a dinner/dance at the Regent Grill, Piccadilly.

Latest Foundry Statistics

Ironfounding: The latest figures released by the Council of Ironfoundry Associations reveal that the increase in employment in iron foundries continues. During the week ending January 30 there were 128,399 ironfoundry employees, an increase of 871 over the figure for January 2 and of 3,149 over that for January 1959.

Light-alloy Castings:

The Ministry of Aviation in a Press release states that the output of aluminium castings during January was 8,659 tons, made up of 1,874 tons from sand moulds, 4,114 tons of gravity-die and 2,671 tons of pressure-die-castings. At this figure, production is running at a rate of over 100,000 tons per annum. The output of magnesium castings during January was 162 tons.

Introducing the Author. . .

Mr. A. P. Riley, whose Paper is printed on the facing page, is foundry manager of Darlington Forge, Limited, a position he has held since 1951. He was educated at Nottingham High School, and on leaving joined English Steel Corporation, Limited, Sheffield, where he served a general enginering apprenticeship, after which he transferred to the Grimesthorpe foundry of the same company as a technical assistant. In 1938, he took a position with William Jessop & Sons, Limited, as assistant to the foundry manager, a position held until 1942 when he left to join the armed forces. On his return in 1946, Mr. Riley rejoined the English Steel Corporation, Limited at Grimesthorpe foundry. In 1947 he paid a four-month visit to the USA to study back-up roll manufacture, and on his return transferred to the Darlington Forge, Limited.

Gating and Feeding of Large Steel Castings*

By Alan P. Riley†

The gating and feeding of large steel castings is a study which, because of its very nature, can have no hard and fast rules. It is dependent on certain basic principles connected with the solidification and cooling of steel and the conductivity and resistance to contraction of mould materials. These, however, are affected so much by factors of mould shape, design, etc., that, generally speaking, experience is the surest guide. Therefore, it is not intended, or even possible, in this paper to lay down a set of rules. All that can be done is to draw attention to certain facts which have in the past proved almost invariable, and to mention changes which have taken place to improve soundness and freedom from defects. These changes have included improvement in design and additional aids to natural atmospheric gravity-feeding.

Large castings in steel can be considered to range from 10 tons upwards. Considerable variations in production methods occur in the lower weight ranges, but above about 75 tons, generally speaking, the conditions are only a question of degree, and mainly affect molten-metal supply, lifting, heat-treatment and transportation. Heat-treatment and transportation can be of considerable importance with lighter castings of large dimensions.

Important Factors

Certain vital factors must be borne in mind when considering the production of large castings:

(*a*) The cost of moulding is high, therefore no undue economy should be made in quantity of steel used, as obviously "samples" cannot be made. It is well to remember that on large castings the steel used (rarely an expensive alloy) is one of the cheapest ingredients in the overall process, and an extra few tons in the heads is a good investment. One could easily be putting only £600 worth of steel as melted into a mould worth £1,500 to £2,000 in labour.

(*b*) The risks are large, and a small saving of moulding time or a skimping of moulding materials could easily result in a scrap casting or, even worse, danger to life and limb.

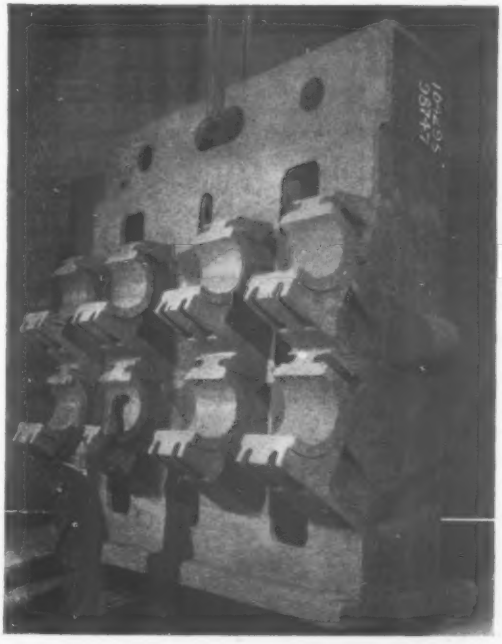
(*c*) Most large castings have heavy duties to perform and therefore should be as sound as human ingenuity can make them.

(*d*) Cost should not be allowed unduly to influence the above three factors.

Castings may be large dimensionally but comparatively small in weight because of thin sections, or may be comparatively small dimensionally but large in weight. In the first category would come such pieces as blast-furnace bells and hoppers, ships' sternframes, shaft brackets, shear frames, car frames, and other general engineering castings for presses and other heavy engineering plant. In the second category would be rolling-mill housings, anvil blocks, back-up and work rolls, fly-wheels and cement-kiln tyres.

The gating of all these castings might not vary

FIG. 1.—*Eccentric-shaft housing casting, weighing 30 tons, which required 23 feeder-heads in its production.*



* Paper first presented at the conference organized, in October last, by the British Steel Castings Research Association on the theme of "Steelfounding Practice." The Author, who is attached to Darlington Forge, Limited, also gave the Paper at a meeting of the Institute of British Foundrymen (Wales and Monmouth branch, West Wales section), on March 28. Permission to reproduce the Paper is gratefully acknowledged—Editor.

† Particulars of the Author's career, and his portrait, are given on the facing page.

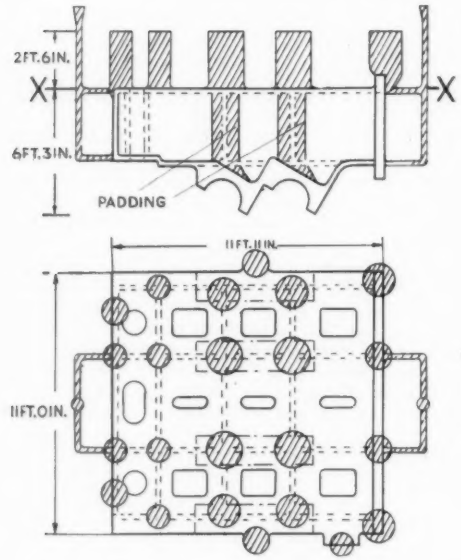


FIG. 2.—*Diagram showing the heads and runners used in making the shaft housing shown in Fig.* 1 (x — x *indicates the mould joint*). *Padding was added internally as shown. Of the* 23 *feeder-heads, four were* 22-*in. dia., six were* 16-*in., six were* 12-*in. and the remainder* 10-*in.*

greatly, but the feeder-heads would vary tremendously. For example, a shaft housing weighing 30 tons, with an average section of 2 to 3 in., had 23 heads varying from 22 to 10 in. dia. (see Figs. 1 and 2), whereas a hammer block weighing 50 tons with a 6-ft. section had one head 64 in. dia. (see Figs. 3 and 4).

FIG. 3.—*Anvil block weighing* 50 *tons, for which only one head was required.*

Downgates and Ingates

On small castings, the size and positioning of downgates and ingates is vital, because of thermal considerations, cleanness and yield. On large castings, the first two factors have a certain bearing, but the latter is of little consequence as the runners are a small percentage of the whole.

Downgates

The size of downgates is usually standard, because runner sleeves are used which are of standard sizes (probably 4½ in. and 3 in. dia.). Speed of pouring is determined by the number of downgates and the ladle nozzle size. Position, where more than one is used, quite frequently is determined by the centre of the nozzles in the ladle and, where two or more ladles are involved, by the centres of the crane hooks of two adjacent overhead cranes. This usually means that launder runners have to be used (see Fig. 5), and the opening of the stream from each ladle carefully timed.

Consideration also has to be given to the position of box bars in top parts, although these, wherever possible, should be arranged to suit the best runner positions rather than *vice versa*. It is important, as well, to position the mould in such a way in the shop floor that when pouring occurs the ladle of hot metal will not be directly under the crane-driver's cab.

Ingates

Ingates, where possible, should be sited to avoid direct impingement on cores or mould faces for an undue length of time. Where this is impossible, suitable protection to the mould face must be provided in the form of flat-headed nails or metal plates. This means that, theoretically, from a cleanness point of view, ingates should be in the bottom of the mould. From a cooling and solidification point of view this is most undesirable. Modern moulding materials are such that they will withstand much more "wash" than heretofore, and as a result top running can quite often be used, with greatly improved results as far as feeding is concerned.

It is perhaps unnecessary to mention, but as a reminder it can be said, that from a thermal point of view, one should always finish with the hottest metal where one wishes the job to solidify last, *i.e.*, the top. It is naturally assumed that the method chosen to make the castings ensures that gravitational feeding and directional solidification can properly take place.

Speed of Pouring

As a general rule, the slower a casting is poured the better, as this allows solidification to occur from bottom to top as the casting is poured; however, this cannot always be the case for two reasons: (*a*) thin sections poured too slowly may freeze and interrupt the pouring, causing cold laps, non-fusing of chaplets, and short runs; (*b*) high-silica-content synthetic moulding-sands expand under radiant heat, and where top parts are exposed to this heat too long severe scabbing will occur.

Quick pouring, however, will almost always result in hot-tears and probably sand inclusions, because a large stream causes more scouring. It will readily follow, therefore, that generally a compromise must be arrived at. Nevertheless, two good rules are: (*a*) top pour where possible, and (*b*) cast as slowly as possible.

Feeding

Positioning of Feeder-heads

The first consideration in the production of any heavy steel casting is to ensure that it is sound. The following factors must therefore be borne constantly in mind:

(*a*) Mould the casting in such a way that wherever possible the heaviest sections are at the top.

(*b*) Where heavy sections are separated by thinner sections, and therefore cannot all be in the top, ensure that the heavy sections in the bottom are adequately fed by the provision of padding to equalize sections, or suitable chills.

(*c*) Where padding or chills cannot be used, ensure that suitable "stop-off" or heel heads are used.

(*d*) Position feeder-heads to cover all the heavy sections.

(*e*) Position feeder-heads so that they can be removed either by burning or sawing with the minimum of trouble and risk.

(*f*) Position feeder-heads to avoid as much interruption to contraction as possible, thereby minimizing the possibilities of hot tearing.

(*g*) Arrange feeder-heads so that moulding is not unduly complicated.

All the above factors must be related to a certain extent to considerations of cost, but these should never be allowed to influence the ultimate soundness of the casting. A small saving in moulding time can quickly be swallowed up by repairs in the fettling shop and consequential additional heat-treatment.

FIG. 5.—(*top*) *Launder runner in position, and* (*bottom*) *pouring simultaneously from two nozzles in the same ladle.*

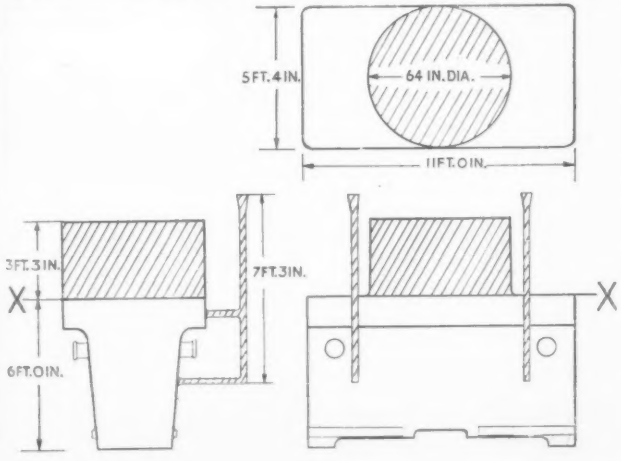


FIG. 4.—*Diagram of the head and runners for the anvil block shown in Fig.* 3 (*x—x indicates the mould joint*).

Proportions of Feeder-heads

The percentage of feed metal required will vary enormously with the type of casting, but in a general jobbing foundry it is probable that every 100 tons of steel melted will produce 60 tons of steel castings. At the lower end of the scale will be found compact solid pieces like rolls and anvil blocks, or symmetrical thin-section castings, such as blast-furnace bells and hoppers, which tend to feed themselves during pouring. Some approximate head percentages would be as follows:

FIG. 6.—*Sternframe casting, showing how the height of the heads is varied when the top of a casting is not flat.*

Anvil blocks 30 per cent.; rolls (according to type) 25-30; blast-furnace hoppers 33; blast-furnace bells 40; cement-kiln tyres 50; cement-kiln rollers 65-70; sternframes 65; gear-wheel blanks 120, and turbine castings 120.

Efficiency of Feed, and Size of Heads

It is generally accepted that a cylindrical head will feed beyond its periphery a distance equal to its diameter, *e.g.*, a 12-in. dia. head 18 in. high should feed a plate 36 in. dia. by 4 in. thick, and give a yield of 66 per cent. The height of a head should normally be 1½ times its diameter, but this obviously varies where the top of the casting is not flat (as in Fig. 6). This can sometimes be overcome by the use of "stop-off" heads, but

FIG. 7.—*Slag-pot casting with two "stop-off" heel heads inside.*

these can very often present a considerable hazard from a safety aspect (Figs. 7 and 8).

Additional Aids to Natural Feeding

Wherever they can be used, natural atmospheric heads, suitably kept "alive," are the simplest to use. Methods of keeping them "alive" are: (*a*) to break the forming skull with wooden sticks or metal rods, and (*b*) to add blacking, mildly-exothermic compounds, chopped straw, vermiculite, etc., at suitable periods after casting. These methods assume that sufficient head has been allowed in the process planning stage, and merely ensure that the feeder-heads do their work efficiently. Where the amount of molten steel is limited, or in the interests of economy, other additional feeding aids can be used. These can be put into the following categories: After-feed heats; electric-arc feeding; exothermic sleeves; exothermic metal additive compounds, and pressure feeding.

After-feed Heats

This is probably the most efficient method of ensuring soundness, although it can sometimes result in the introduction of dirt and slag into the casting. Where a small melting unit is available, steel can be added at suitable intervals after the preliminary pouring; this process can be continued almost indefinitely until solidification is complete. Suitable facilities, however, do not always exist, and other methods therefore have to be used.

Electric-arc Feeding

This method is, in principle, a small electric furnace introduced into the head or heads of the casting. Earth bars are embodied in the mould and a carbon electrode is introduced into the molten steel in the casting head. Current is passed through, and an arc created which maintains molten steel until solidification in the casting is complete. On compact pieces this system is ideal, and up to three arcs can be used in one head. On complex castings, however, practical considerations restrict its use, and it is rare to have more than three heads fed in this manner on any one casting (see Fig. 9).

Exothermic Sleeves

Sleeves of materials which react and emit heat upon contact with the molten steel can be rammed up to form feeder-heads. Their use is limited on large heads for two reasons: (*a*) Above about 30 in. dia. the effect is not sufficiently felt over the whole diameter, and (*b*) the reaction takes place immediately after casting, and does not last long enough where solidification of the main mass of casting extends over many hours.

Exothermic Metal Additive Compounds

These are, in principle, the same as the well-known "Thermit" welding compounds. They are better than sleeves in that they can be added at timed intervals as desired. They should not be considered generally as an integral part of the casting process, but can usefully be employed as an "insurance" that the residual feed metal is kept "alive." They have the disadvantage of having a

FIG. 8.—*"Close-up" view of one of the slag-pot heel heads shown in Fig. 7.*

somewhat violent reaction, the results of which can be very uncomfortable for overhead crane drivers.

Pressure Feeding

Experiments have been carried out in an endeavour to assist feeding by applying pressure to feeder-heads. This has been done with compressed air and also with "bombs" of various gases. Generally speaking, results have not been sufficiently good to justify the additional costs involved in the practical application.

Conclusion

The most important considerations ensuing from the foregoing are:

(*a*) That first consideration should be the ultimate production of a sound, serviceable casting.

(*b*) That factors affecting soundness and therefore scientific feeding should be fully considered before moulding, or even patternmaking, commences.

(*c*) That no undue economy in moulding methods, moulding materials, or moulding tackle should impair safety.

Acknowledgments

The author wishes to thank the directors of the Darlington Forge, Limited, and English Steel Castings Corporation, Limited, for permission to publish this paper, and to reproduce illustrations. He would also like to thank the foundry staff at Darlington who have assisted in its preparation.

FIG. 9.—*Three electric arcs are shown feeding the heads of one casting.*

Speculative Shipbuilding Reports

Reports of proposals for merging shipbuilding firms are described by the Shipbuilding Conference as "pure speculation." It adds that suggestions made that there are plans for the closing down of individual shipyards are entirely without foundation.

"Moreover," the statement continues, "no proposals have been made by the industry that the Government should provide financial aid on such lines as for cotton, steel, and aviation."

The Ministry of Transport has also denied that the Government is trying to force on to the industry the kind of mergers which have taken place in the aircraft industry.

A spokesman for the Ministry said that the object of setting up the Shipbuilding Advisory Committee was to obtain advice on what could best be done to help British shipbuilding firms to improve their competitive efficiency. Nevertheless, it was possible that mergers would be considered along with many other suggestions.

Powell Duffryn's Acquisition

By acquiring the share capital of Hurseal, Limited, heater manufacturers, of London, W.1, Powell Duffryn, Limited, of London, E.C.3, has taken an important step in the development of its interests in the marketing of heating and air conditioning equipment. The purchase price for the 160,000 £1 ordinary shares was 47s. 6d. a share, a total of £380,000.

Together with its subsidiary, Gulf Radiators, Limited, of Cardiff, Hurseal makes a wide range of equipment for domestic and industrial central heating.

The Hurseal board has been reconstructed. Mr. Miles Reid, a director of Powell Duffryn, has joined it as chairman in succession to Mr. R. S. Bassett, who retires. Mr. O. Keir and Mr. B. W. Wade also retire. Mr. W. H. Sharland, deputy chairman of Powell Duffryn, and Mr. R. Turner, managing director of Powell Duffryn Technical Services, Limited, join the board. Mr. A. C. Hazel will continue as managing director.

American Letter

Feeding of Grey-iron Castings*

The purpose of this study was to determine the feeding distances of grey-iron castings, in order to permit accurate selection of the number and location of feeder-heads. Feed metal cannot usually be supplied by feeder-heads for more than a certain maximum distance. A precise knowledge of these distances is of great assistance in the selection of the proper location and number of heads to be used.

Mould-wall movement may markedly influence feeder-head requirements. Mould cavity enlargement in green-sand moulds is primarily caused by the moisture in the sand, the hydraulic pressure of molten iron, and the push occurring during eutectic expansion. However, such enlargement is not a serious problem with inherently rigid moulds, such as dry, core or CO_2 -set moulds. Accordingly, the authors used rigid moulds to determine the feeding distances.

As stated, the test castings were rammed up in a moulding sand that was designed to remain rigid during pouring and solidification. A sodium-silicate bonded moulding sand, set after ramming by gassing with CO_2, was used for the first test heat, the remaining three heats being rammed in a similar sand bonded with a cold-setting core-oil. All the castings were poured in a horizontal position, and cooled in the mould to below 482 deg. C. before shakeout. The cast sections employed in the investigation were two bars, 1 by 1 by 60 in. long and 2 by 2 by 60 in. long, and one semi-circular plate section 1 in. thick with a 60-in. radius. The feeder-heads were located at one end of the bars, and in the middle of the straight side of the plates (see Table 1). The alloy compositions selected included almost the entire field of commercial grey-irons, the four heats being poured with carbon equivalents of from 4.1 to 3.3 per cent.

All the castings were sand-blasted and inspected for surface irregularities, sinks and other defects, and the bars and the section from the plate were examined radiographically. All the bar and plate grey-iron castings appeared to be sound visually and radiographically, and no evidence of shrinkage defects of any type was found on etched slices from the bar and plate sections. These results indicated that, when grey-iron is cast in a rigid mould, the self-feeding produced by the graphite eutectic expansion is sufficient to comply with feed-metal needs, provided that a feeder-head is available to satisfy the initial liquid and solidification contraction requirements. It was also discovered that solidification contraction increases as carbon equivalent decreases. These conclusions on effective self-feeding are for a range of chemical compositions of from 3.26 to 4.11 per cent. carbon equivalence, as shown by the analysis in Table 2. It was concluded that the feeding distance of adequate grey-iron feeder-heads for uniform, simple casting shapes poured in rigid moulds is unlimited for all practical purposes, since the heating effect of the head, and cooling influence of the end of the casting, produces the required thermal gradients.

TABLE 1.—*Details of the Gates and Feeder-heads used in the Tests on Grey-iron Castings.*

Heat No.	Casting size.	Feeder-head dia. (in.).	Feeder-head height (in.).	Feeder-head neck dimensions (in.).	Sprue top (sq. in.).	Sprue choke (sq. in.).	Runner area (sq. in.).	Pouring time (sec.).
1, 2, 3, 4	Bar (1 by 1 by 60 in.)	2	3*	0.5 long by 0.8 dia.	0.47	0.23	1.00	5
1, 3	Bar (2 by 2 by 60 in.)	3	4*	1.0 long by 1.5 dia.	0.60	0.30	1.20	18
1, 2	Plate (1-in. thick, 60-in. radius)	6	8	†	5.56	2.78	11.20	40
3	Plate (1-in. thick, 60-in. radius)	7	9	†	5.56	2.78	11.20	40

* Plus hemispherical bottom section. † Feeder-head flat on bottom, one half of bottom surface resting on plate surface.

TABLE 2.—*Chemical Composition, and Temperatures, of the Test Heats.*

Heat No.	Final chemical Composition. (per cent.).									Average temperature (deg. C.).		
	C	Si	S	P	Mn	Cr	Ni	Mo	C.E.	Cupola tapping.	Holding-ladle tapping.	Ladle pouring.
1 (not inoculated)	3.44	1.92	0.134	0.077	0.72	0.08	0.16	0.05	4.11	1,540	1,460	1,380
2 (inoculated)	3.26	1.56	0.120	0.057	0.65	0.13	0.22	0.07	3.80	1,510	1,455	1,400
3 (inoculated)	3.28	1.62	0.099	0.062	0.64	0.02	0.07	0.03	3.84	1,520	1,475	1,395
4 (inoculated)	2.91	1.00	0.060	0.055	0.43	0.11	0.16	0.06	3.26	1,480	1,440	1,360

* Carbon equivalent = C + (⅓Si + P).

* Summary of a progress report by the Grey Iron Division of the American Foundrymen's Society's Training and Research Institute. The authors are G. K. Turnbull and H. D. Merchant (graduate assistants), and J. F. Wallace (associate Professor), Case Institute of Technology, Cleveland.

Fall in Bronze Prices

A survey of American ingot makers and consumers has indicated that the recent reduction in brass and bronze prices has now intensified—some ingot makers are selling certain of their materials as much as three cents below published prices. There are more than 60 ingot makers in the US making alloys for valve companies, fittings manufacturers, engineers' foundries, plumbing fixtures foundries, railroads, bearing producers and jobbing foundries. One hardware manufacturer reports that, while he has always been able to get 85/5/5/5 ingots at least one cent below the official quotation, lately he has been buying them at 2 to 2.5 cents less per lb. Price shading up to approximately one cent per lb., especially in the East, is normal in the industry.

The weakness in the brass and bronze market is said to be caused by (*a*) slow business in the foundries; (*b*) a sales picture ranging from "poor" and "disappointing" to "slow" and "not as active as forecast" and (*c*) more competition from outside the industry. With a weakening copper-scrap market, ingot makers are paying les for their principal raw material, and scrap buying prices have declined ½ to 1 cent—the supply of scrap is plentiful.

Ironfounding Health and Safety

Report of Papers and Discussions of the CFA Blackpool Conference, April 6 to 8

Close on 100 foundry executives assembled at Blackpool for a two-day conference on wide aspects of health and safety as related to ironfounding, which was organized by the Council of Ironfoundry Associations from the afternoon of April 6 until lunchtime on Friday, April 8. The whole proceedings were held in the Norbreck Hydro Hotel and this proved an admirable venue.

At the outset, it is necessary to correct any impression that the conference was a pleasure-trip for the delegates to a seaside resort, entailing but a modicum of business. Indeed, the reverse was the case, the Hotel is situated in the part of Blackpool remote from the "Big Dipper" and other promenade-side distractions and the meagre spare time at delegates' disposal was barely sufficient for making a three-minute late-night telephone call home or for sending a five-word postcard.

Mr. H. Bonney, F.C.I.S. (managing director, Follsain-Wycliffe Foundries, Limited), chairman, CFA Health and Safety Committee, presided at the whole of the conference, supported on occasions by other members of the Council. The proceedings took the form of evening meetings on the first day, followed by an industrial film-show after dinner; a full day of meetings on the Thursday, with discussion groups carrying on until late evening and then further reports and papers on the Friday morning. Adjacent to the conference sessions, but partitioned off, was a small exhibition of safety appliances, arranged by many of the leading producers of this equipment in this country.

Opening Session

In a brief introduction to the proceedings after formally declaring the conference open, Mr. Bonney said that this conference was the first for six years and in the meantime there had been many developments which needed discussion, and on which expert opinion could now be taken with advantage to ironfounders generally and those assembled in particular. Especially he referred, of course, to the practical working out of the Iron Foundry Regulations and of the Clean Air Act. The gathering was honoured, he said, to have as the opening speaker Mr. T. W. McCullough, O.B.E., (HM Chief Inspector of Factories). The other speakers were all experts in certain aspects of safety, accident prevention and employee welfare, and no doubt the assembly would gain much from listening to them and putting forward queries.

Problems of Industrial Health and Safety

By T. W. McCullough, O.B.E.

On the above subject, the Chief Inspector then addressed the meeting, much in the following words:

I am deeply sensible of the honour you have done me in asking me to give the opening paper at your conference, the first since the one you held at Ashorne Hill some six years ago. Since that time, many improvements have taken place and although some problems have been solved, some still occupy our close attention. It was of great interest to me to see how widely you had cast your net in choosing subjects for discussion—as your programme* bears witness. They are some of the most important facets of the many-sided problems of safety, health and welfare.

The Three P's

The main ingredients of our factory system all begin with the letter "P"—premises, plant and processes, and all our problems arise from the relationship of these three ingredients with the fourth and most important one, namely *people—i.e.*, the people who work in the premises—with the plant—on the processes.

Since I succeeded Sir George Barnett just over two years ago, I have perforce ceased to be especially knowledgeable in any particular subject, for I have a vast field to survey in which foundries—whether iron, steel or non-ferrous—are but a part. Consequently, I have chosen a general title for my talk—"Problems of Health and Safety." At first sight, these two matters seem quite separate and for many purposes it is useful so to regard them. Nevertheless, at times they come very close and occasionally even merge.

There are several conditions to be postulated:—(*a*) A man should arrive at his place of work and leave it, when his stint is done, in a state of physical and mental wellbeing; (*b*) his conditions of work should be both safe and healthy. The Factories Act and Regulations lay down certain minimal standards with these ends in view. This evening, however, I want to discuss these matters more from the quasi-philosophical aspect rather than from the legal viewpoint, in the hope that you will the better be able to focus upon the realities with which the rest of my fellow speakers will deal in the next two days.

Accidents

First, as to accidents. I want to refer to the statistical side of my annual report for 1958. I promise I shall keep figures down to a minimum, but it is essential to quote a few to develop my argument. Now it is true that the general trend of accident figures has been downwards, in fact with minor interruptions the curve has been moving in that direction since the end of world war II. The figures for 1958 were in fact the lowest since 1935. They are a great tribute to all those who in various capacities, both in and out of the fac-

* The conference programme was printed in the JOURNAL, March 17 issue.

tories, have in one way or another been contributing their own individual efforts to—and moulding the thinking and attitudes to—the great cause of accident-prevention.

The figures are, however, still too high and are falling too slowly. The overall drop for all industries subject to the Factories Acts, taken over the past 10 years, averages $1\frac{3}{4}$ per cent. per year, while in factories alone the decrease, though larger, averages only $2\frac{1}{2}$ per cent. If we are to consider possible ways of making a further and more rapid decline in the figures, we must dissect them a little. If you look at my annual report for 1958, you will find in it a diagram showing the principal causes of the 167,000-odd accidents reported to HM Inspectors of Factories. Power machinery accounted for only one-seventh and, leaving aside many of the minor causations which, though serious in themselves, have not produced significant figures against the background of the whole—I here refer to such things as fires, explosions and electrical accidents—there are five great causes: Handling of goods (which accounted for just over a quarter of those 167,000-odd accidents); persons falling (accounted for one-seventh), and being struck by falling bodies (accounted for one-twelfth, as did stepping on or striking against objects, and the same holds true for accidents due to hand tools).

Danger of Complacency

I have a feeling that we are in danger of becoming complacent about this. Year after year the figures appeared in the annual reports of my predecessors in roughly the same proportions. I do not think it is generally realized that no less than 67 per cent. of the accidents in 1958 were due to the five causes I have already enumerated. I sometimes ask myself are we accepting them or, worse still, are we shrugging them off by saying to ourselves: "Well, you can't remedy these things by law," "Some people will always use defective hammers, chisels and the like," "People *won't* look where they are going," "People *will* try to lift weights which are too heavy," "People *will* be untidy and leave things about to trip the unwary."

I am quite satisfied that in many of these accidents there are contributory factors. Untidiness, uncleanliness, bad lighting, extremes of temperature and overcrowding are examples which readily come to mind. You will observe, in passing, that some of these ingredients, such as cleanliness, temperature and overcrowding, might be regarded as matters of health rather than matters of safety. This underlines the point I have already made—that in some cases health and safety have common factors. Time does not permit me to make an exhaustive analysis of the "big five" group of accidents, but suffice it to say that the wearing of suitable protective clothing in suitable circumstances would go far to make a significant impact in reducing the figures of 167,000-odd to which I have already referred.

Considering the feet, the hands, the eyes and the head, safety boots, gloves, goggles or screens and safety helmets in appropriate cases would have saved no fewer than 25,000 or just over one-seventh of the total.

Why Accidents?

Now why are these accidents happening? Is it because our communications are not right? Basic thinking on this matter must take place in the boardroom, but this thinking must get down through the foreman to the shop floor. It is useless to pay lip-service to accident prevention. Positive and imaginative policies must be thought out and put into execution with drive, courage and tenacity, under the direct control and with the full weight of the "head of the house." In far too many factories, accident prevention consists of putting up a few posters on the wall and the engineer or the general handyman is re-christened the "safety officer," in addition to all his other duties. I think at times we have a tendency to under-rate the intelligence of the great mass of the working population. It is a question, I think, of finding the right appeal. If the right appeal can be made and reasons properly explained, the co-operation of workpeople should follow, but—and I underline this point—the appeal and explanations must be made sensibly, with tact, with understanding and with imagination. Example is always better than precept. To see the managing director and the shop foreman wearing goggles in the foundry is worth far more than a wall covered with posters. To know that the "top people" rate safe methods of working as highly as the output figures goes a long way towards success in both directions.

In conjunction with what I might term the psychological approach, there should also be a physical approach. Work must be planned for accident prevention in the same way that production is planned. The processes, the plant, the machinery, and the works layout should be designed to achieve the maximum safety and redesigned if necessary. Safety should become the natural way of thinking for everyone—the architect, the planning executive, the engineer, the foreman and the chargehand, and the worker primarily. This means co-operation at all levels. It means proper communications at all levels. This is a simple fact staring us in the face; it is perhaps so obvious as not to be readily seen.

It can be done!

I have given my first emphasis to good industrial communications as the lubricant for an effective safety policy, but more is required. Neither the lubricant nor the driving power of the man in charge is sufficient, he must see the policy spread down the production line to the shop floor. There is nothing revolutionary or starry-eyed in this conception. In some of the best firms, it is already commonplace. For example, I can quote a factory in a dangerous industry, employing 1,400 people, yet it had only 3 reportable accidents in 1958, with a frequency rate of 0.25, which is a quarter of the

national figure for that particular industry. The explanation is quite simple—in this factory every man is his own safety officer and that I think is the ideal for which we must strive.

Industrial Health

Hitherto, I have talked about accidents and the need to achieve their reduction by adopting safe working-practices and, as a corollary, by the promotion of good working-conditions, with their indirect benefits to safety and output. There is, however, another and no-less-important aspect to be considered. For many years, HM Factory Inspectorate has, as a team, been concerned with the occurrence of disease of industrial causation and I think the tendency in the past has been to concentrate on these maladies and perhaps as a result to underestimate the part played by a man's occupation in causing disabilities common to mankind. I might mention chronic bronchitis and rheumatic disorders in this context. These are prevalent but are not restricted to particular employments. Happily to-day the position is changing fast and for the better. Some of the old industrial diseases such as lead poisoning are in retreat, but some are still with us and I am quite satisfied that your particular problem of pneumoconiosis must loom large in your thoughts—in fact the whole of to-morrow morning's papers are being devoted to it.

With a change of emphasis and outlook, there has come about a realization that it is not sufficient merely for a man not to be ill. We must all be concerned to achieve working conditions conducive to a state of positive health and wellbeing. I have seen quoted figures to the effect that for every day lost to industry through industrial disputes, seven are lost through accidents and no fewer than 100 through sickness. It would, of course, be quite improper to infer, as is sometimes done, that this sickness is all due to the industrial environment, because if a man works for eight hours a day he still has 16 hours in the 24 away from work. Other factors must be taken into consideration, for example, conditions in the home, personal habits, the spending of leisure-time, even inherited propensities to disease. All these must be taken into account in assessing the true position. This new and more positive approach to problems of industrial health cannot, to achieve the fullest success, be the monopoly of any one group or profession. It requires, for example, the work of a team, including the doctor, the engineer, the chemist, the physicist and the firm itself. Each has an individual rôle; each has its own particular contribution to make to the solution of the problem, and it is only by concerted action that fruitful results are obtained.

This changing outlook, which is steadily gathering momentum, has already achieved one most significant result. Parliament from time to time enacts legislation which reflects sociological changes and it is, I feel, a matter of the deepest significance that the positive approach to problems of industrial health and safety has achieved recognition in the recently enacted Factories Act of 1959, section 26 (1) of which requires that "the Minister shall promote health, safety and welfare in factories and premises and operations to which the principle Act applies, by collecting and disseminating information and by investigating or assisting in the investigation of problems of health, safety and welfare."

Tribute to BCIRA

I think I should also at this stage pay tribute to the work which is being done at Alvechurch by your research association. I would refer to what has already been done there in developing an efficient exhaust system for the abrasive wheel, experimental work on dust-suppression at the knock-out and what is now being done by way of dust sampling and analysis, including the use of X-ray diffraction apparatus to estimate the quartz content of the dust.

The Inspectorate and both sides of your great industry have always enjoyed the happiest relations, and the work done by the Joint Standing Committee on safety, health and welfare is an example for other industries to copy in their respective fields. I was, as many of you know, a member of the original Joint Advisory Committee on Conditions in Iron Foundries in 1946, from which this Joint Standing Committee stemmed, and I have always regarded it as a great privilege that for a time I was permitted to be its chairman, as one of Sir George Barnett's deputies, and that it was during my chairmanship that we published our first report in 1956.

Essential Identity of Interests

It is fitting too that I should refer to the work that has been done over the years by the CFA Health and Safety Committee (over which your chairman himself now presides) and the work that has also been done by the Foundry Atmospheres Committee.

But let me return for one final moment to another person, who is not present at this conference but whose shadow is ever with us—the man who gives us the reason for our presence here to-day—and that is the man who works on the foundry floor. Let me in conclusion remind you of the words of Shylock in defence of his race (taken somewhat out of their context, but very relevant to that man) "Hath he not hands, organs, dimensions, senses, affections, passions? Fed with the same food, hurt with the same weapons, subject to the same diseases, healed by the same means, warmed and cooled by the same winter and summer as the rest of us? If you prick him does he not bleed? If you tickle him does he not laugh? If you poison him does he not die?"

At the conclusion of Mr. McCullough's address, Mr. Bonney voiced the appreciation of members and their thanks to the Chief Inspector, especially for making time to present it in person and for offering to deal in a general way with questions from the assembly.

Discussion

The first question put to Mr. McCullough invited him to comment on causes of lost time amongst

employees and where the "line" could be drawn, as for instance, including or excluding the common cold. To this the Inspector replied it was difficult to lay down rules. Nowadays children were looked after right up to the end of their school life and it might be, as a start, that some of this care in future would be extended to when they were in industry. Asked how the foundry industry "was doing" in health and safety matters in comparison with other heavy industry, Mr. McCullough said comparisons were invidious but the foundry industry had certainly instituted great improvements and it was pleasing to record that eye accidents and burns had been much reduced. It was being made clear that founders' own work in the field of safety was having significant results and here he was pleased to record the Foundry Unions had acted in concert with employers. In fact, the Amalgamated Union of Foundry Workers was the only trade union which fully supported the activities of the Royal Society for the Prevention of Accidents (RoSPA). This might be taken as indicative of the way in which trade union movements generally could play a much bigger part, *i.e.*, they had a new responsibility to try to stop accidents instead of trying merely to secure compensation for their members when accidents occur.

This support of the Trade Union was confirmed from the chair and further questions put to Mr. McCullough ranged over the ease of getting compensation for Common Law claims (which, being a legal matter, he declined to comment on); the possible distraction to foundrymen at work by the appearance amongst them of elegantly-dressed lady factory inspectors, and the alleged increased incidence of skin diseases since the introduction of the CO_2 Process.*

CO_2 Process and Dermatitis

On this latter point, Mr. Bonney said the Non-ferrous Standing Committee had decided amongst themselves that the CO_2 Process did not have any effect on dermatitis. One of the medical fraternity present then said that once founders realized that silicate-bonded sand was stickier and more abrasive —when partially set—than other sand and that it thus necessitated a higher degree of personal cleanliness, no further trouble was found. Generally speaking, dermatitis, the doctor continued, was not cured by barrier creams but by educating personnel towards cleaner habits. With the CO_2 Process, it was a matter of getting people accustomed to a new material—and proper handling methods for the silicate must be instituted, of course. When the CO_2 Process was adopted at the foundry to which he was attached, inquiries had been addressed regarding its use to manufacturers of silicate and to existing users; amongst them no trouble from occupational dermatitis had been reported.

A vote of thanks to Mr. McCullough for his address was voiced by Mr. K. Marshall, director of the Joint Iron Council, who said that members of the Factory Department were rightly regarded as a race apart from the average civil servant and this was much appreciated by industry; Mr. McCullough in particular epitomized this friendly co-operation. He himself had welcomed the change of emphasis on the part of the Factory Inspector to aspects of health and safety and offered full co-operation of the ironfounding industry. Finally, he took the opportunity of asking Mr. McCullough to use his influence with the Department of Scientific and Industrial Research to get a larger grant of money (or perhaps a special grant) to enable the British Cast Iron Research Association to enlarge their research into safety aspects of foundrywork. Mr. McCullough replied here that this point was well taken.

EXHIBITION

As previously mentioned, throughout the whole period of the conference, there was opened at the other end of the hall a small exhibition of safety appliances, clothing and equipment. Exhibits were arranged as shown on the facing page.

Browsing around the stands, the writer was much interested in the variety of safety footwear exhibited. There seemed to be every style of upper and every type of sole which could be desired—including models in which senior executives would not be ashamed to be seen in their West End Club! This effectively disposes of the idea that safety footwear is inevitably clumsy looking and reinforces the dictum expressed at the conference that to encourage the idea of wearing protective devices amongst workmen, it should be a *sine qua non* for executives to set the example. (Apropos this comment, the writer himself was so impressed that he bought a pair of safety shoes on the spot for use when visiting foundries and other works!)

The first-aid cases on show were all to the new British Standard that was discussed during one of the lectures of the conference (on the Saturday morning) the absence of liquids in little bottles being conspicuous. At the stand of J. & R. Fleming, it was interesting to learn that the company has recently taken an agency for American designs of spark-proof tools (developed by Ampco Metal Inc. of Wisconsin, US). Of additional note here was a Master Vision Screener unit. This is a table-size piece of equipment which a person can use to test his own eyesight to the extent of saying whether or not he should consult an optician. Another unit exhibited here, along with goggles, was a cleaning cabinet by which such protective devices can be kept in good order with a minimum of trouble.

Most of the stands had available leaflets and other literature amplifying the displays. Amongst these was illustrated a gadget known as the Lamb Air Mover (shown by Mine Safety Appliances Company) which can be used to cool down a furnace preparatory to patching. By this means it is claimed that red-hot refractory can be cooled very rapidly so as to avoid furnace idle-time. On the stand of the R.F.D. Company, Limited, a question from one of the visitors was overheard as to

* Further reports of papers and discussions at the conference will be printed shortly.

Safety Exhibition At a Glance :

Firm	*Products on Show*
J. & R. Fleming, Limited (Safety Equipment Division), 146, Clerkenwell Road, London, E.C.1.	Respirators; gloves; safety hand tools; visual eye-checking machine; goggles; lens-cleaning materials; false eyes.
Boots Pure Drug Company, Limited, Station Street, Nottingham.	First-aid cases.
Martindale Electric Company, Limited, 3, Westmorland Road, London, N.W.9.	Heavy-duty respirators.
Betts & Broughton, Limited, King Street, Huthwaite, Sutton-in-Ashfield, Notts.	Safety footwear.
Courlak, Limited (a Courtaulds Company), Cheapside, London, E.C.2.	"Textuff"—a new protective textile.
Safety Products, Limited, Holmethorpe, Redhill, Surrey.	Gaiters; visors; goggles; visors with incorporated respirators; helmets with incorporated respirators.
A. L. White & Company, Limited, Low Lane, Horsforth, near Leeds.	Safety footwear.
R.F.D. Company, Limited, Godalming, Surrey.	Foundry and hot-entry suits: shotblast suits and helmets.
Mine Safety Appliances Company, Limited, Queenslie Industrial Estate, Glasgow, E.3.	Helmets: visors; goggles: "Dustfoe" respirators; gas detectors.
British Cast Iron Research Association, Alvechurch, near Birmingham.	A display of seven models of respirators approved to date by the Factory Inspectorate. These were the Dustfoe 66, Martindale H.D., Draeger 74/545: Microfilter; V.H.E.: Mark IV and Mark VIII.
Council of Ironfoundry Associations, 14, Pall Mall, London, S.W.1.	Foundry gaiters and respirators produced by various makers.

what means were available for speaking to operators when encased in shotblast helmets—a frequent cause of annoyance being when instructions given are misunderstood. The inquirer was told that the company is at present working to develop a two-way voice-energized "lifeline" and particulars are expected to be available shortly. It transpired that the man who made the inquiry was so convinced of the necessity that he had already prepared for himself a home-made device for the purpose, using ex-WD material.

On the stand of Safety-Products, Limited, a feature was made of lightweight goggles and such types are now so comfortable to wear for even long periods that workmen have no excuse for being without them. Protective helmets were featured on several stands and the remark just made regarding goggles applies in the same way, namely, that lightness and comfort have been well studied.

Fabric for Protective Clothing

One of the exhibits, that of Courlak, Limited, showed the entry into the clothing field of a fabric previously used for the making of motor-car seats. Here, a pair of protective trousers was on view which had been in use by a workman in one of Ford's foundries for a period of six months and which, though dirty, showed no sign of wear. Quite colourful designs of this material were revealed by the patternbook. Also claimed for it are that it repels sparks, does not easily crease in a way to provide resting places for molten metal, that it is light in weight and "breathes" to afford comfort to the wearer; it can be cleaned with white spirit, but wetting and hosing, it is stated, will not destroy its properties. The firm mentioned only sells the material, but it is understood that at least one garment manufacturer—Arthur Miller & Company, Limited, 175, Bermondsey Street, London, S.E.1—is already making up protective clothing from it.

The same congratulatory comments as were made earlier in this report with regard to footwear apply equally well to gloves, gaiters, aprons, asbestos suits and similar protective clothing. In every case, the maximum comfort of the wearer consistent with safety has been incorporated in the design. Particularly do the special requirements of foundrymen appear to have been studied.

Obviously a brief review of the salient features of the stands cannot be exhaustive and apologies are made for the inevitable omissions. There were at every hand gadgets of interest and many of them new to delegates. The writer is of the opinion that the exhibition did much to support the aims of the conference and in fact it could have been enlarged with advantage, possibly with the addition of lifting slings and other devices, flame-failure equipment and illustrations of the use of safety colours and markings. But of course it was essential to confine it within the precincts of the conference room and maybe other ideas can be elaborated at any future event.

A TREATMENT WORKS is to be constructed at a cost of £399,390 for water supplies to the Spencer steelworks, Llanwern (Mon).

FOLLOWING the establishment of sales companies in France, Germany, and Italy, Joseph Lucas (Industries), Limited, Birmingham, is continuing its expansion programme by forming a Swedish sales company, Lucas Nordiska, AB, to cover all the Scandinavian countries, including Finland.

POLLARD BEARINGS, LIMITED, Ferrybridge, has acquired the ex-Ministry of Supply property at Monkhill Lane, Pontefract.

AFTER FIVE WEEKS 26 riveters who went on strike because welders and platers at the Clyde shipyard of William Denny & Bros., Limited (Dumbarton), refused to accept redundant riveters in their departments, returned to work on April 11, as did the 600 men who were laid-off because of the dispute.

Equipment & Supplies

Screen and Conveyor

Sinex Engineering Company, Limited, North Feltham Trading Estate, Feltham, Middlesex, have now manufactured a 60-ft. long conveyor of which the final 10-ft. length includes on its surface two meshes. The conveyed material passes over the first mesh, but any dust fines fall through to a waste hopper. On the other end of the section is a coarse mesh, through which the material passes through into a hopper feeding a bagging plant. The present application is for ¼ in. plastic cubes, but other materials can be handled. Any over-size material which may have been incompletely diced continues over the mesh into a collector hopper. It is believed that this combined function of conveying and screening can result in considerable economies, and save much space in a number of industries. The conveyor is powered by two contra-rotating vibrators. Apart from these units, the overall height of each section is some 9 in., the conveyor being 4 ft. wide.

Separation of Materials by Vibration

A further interesting phenomenon of vibratory conveyors is being developed for commercial use. This is based upon the relative speeds of different materials on the same conveyor. Materials of higher specific gravity and different granulometry travel at different speeds, so that if a batch of, say, grain and chaff were fed on to a conveyor the grain would accelerate, and consequently over a length of, say, 20 ft. would separate from the chaff, which would follow behind. Then, by the use of a diverter built on the end of the run, the grain could be fed into one bin, and the chaff into another. By the use of meshes and diverter plates, it may well prove possible to separate many mixtures which have hitherto proved difficult to handle by normal screening techniques.

Quick-release Coupling

A new quick-release self-sealing coupling, designed for use in hydraulic feed lines with working pressures up to 3,000 lb. per sq. in., is announced by Super Oil Seals & Gaskets, Limited, King's Norton, Birmingham. The new coupling is an addition to the manufacturer's range of Aeroquip flexible hose and end fittings. It is being made with either British standard or American threads, and, by the use of adaptors, is available in ¾-in. and ½-in. sizes. The coupling is designed for use on both general industrial and agricultural equipment. Simple in construction, the coupling consists of two halves, each using a spring-loaded poppet sealing valve and a spring-loaded thimble ring for quick attachment. When connected, the halves of the coupling are sealed with a rubber sealing-ring and held in position by a series of hardened-steel balls working in tapered location holes. Tests have shown that there is negligible restriction to the flow of hydraulic fluid through the coupling.

Shotblasting Helmet

A new model of the Saferhelm air-fed shotblasting helmet has recently been introduced by Heafield Industries, Limited, Spa Lane, Derby. Known as the Saferhelm Mark II, this helmet has a new design of shell, with the air-inlet at the rear. The window aperture is larger, and has an inner window which need not be replaced unless it is damaged. The outer window consists of clear, tough P.V.C. drawn from a reel casette (patent applied for) over the aperture at the front. When this outer window becomes marked, the operator has only to pull down the next clear section of P.V.C. from the reel, instead of removing the whole outer window from its frame and fixing a replacement. Spools can be changed in a matter of seconds, and are supplied complete with reels. There is enough P.V.C. for eight new "windows" on every spool.

Bag Filter

A recent addition to the range of dust-collection and control equipment manufactured and marketed by the gas cleaning division of W. C. Holmes & Company, Limited, is the Holmes-Retroflux bag filter. This filter was developed by Standard Filterbau G.m.b.H., of Munster, and is to be manufactured under licence in the United Kingdom. An efficiency in excess of 99 per cent. for all particles, including those of sub-micron size, is claimed.

In operation, the dust-laden air enters a header within the casing and is distributed to the inside of the filter bags, the air and dust moving in the same direction. The tendency of the dust to settle by force of gravity is not impeded by air currents, as the air passes through the filter bags radially and the air velocity gradually diminishes to zero at their lowest end. The dust collected on the inner surface of the filter bags is continuously dislodged by the passage of high-velocity air jets through the fabric in the reverse direction to the main air stream. The use of high-velocity air jets is a design feature of the bag filter, which dispenses with the rapping or shaking mechanism and separate compartments of other bag filters.

Solid Casting Resin: Shell Chemical Company, Limited, 15-17 Great Marlborough Street, London, W.1, announce the addition of a new solid casting resin, Epikote 1040, to their range of epoxy resins. The new material is intended for use with a new curing agent, Epikure EPA, and has been developed specially for the production of large castings. The cured resin is claimed to have excellent chemical, electrical and thermal-shock resistant properties.

Moisture-test Apparatus: The Harry W. Dietert Company, 9330, Roselawn Avenue, Detroit 4, Michigan, USA, announce that they have now placed on the market the No. 277 moisture teller. The company claim that this unit, which retains the characteristics of earlier models, reaches a pre-set drying temperature faster. With it, no chemicals are used and no special calibration is required.

Board Changes

WILMER LEA FOUNDRIES, LIMITED—Mr. Charles Karen, chairman of Charles Karen & Son (Holdings), Limited, has become the new chairman and joint managing director following a bid by the Karen Group for the capital of Wilmer Lea Foundries and its acquisition of a substantial majority holding.

LAPORTE INDUSTRIES, LIMITED—Mr. C. B. Bolland has been appointed executive chairman of Laporte Acids, Limited, the Sheffield Chemical Company, Limited, James Wilkinson & Son, Limited, and Glebe Mines, Limited, all subsidiaries of the company, in place of Mr. James Jones who will relinquish these positions, but will remain on the board of the company. Mr. Alexander M. Fenton has retired as a director of Sheffield Chemicals, James Wilkinson & Son, and Glebe Mines.

Personal

Mr. S. L. ELLIOTT has been appointed a director of Shanks & Company, Limited.

Mr. C. J. HIND has been appointed engineering director of Ruston & Hornsby, Limited.

Mr. H. KIRK has relinquished his seat on the board of Blakey's Boot Protectors, Limited, Armley, Leeds.

Mr. C. F. WATTS has been appointed a director of Wickman, Limited, following the death of Mr. G. R. MARSH.

Mr. LIONEL HARPER, assistant managing director of Massey-Ferguson (Great Britain), Limited, has resigned from the company.

Mr. H. L. SALTER has been appointed a director of the Fullers' Earth Union, a subsidiary of Laporte Industries, Limited.

Mr. J. W. BODDY and Mr. P. C. SALTMARSH have been appointed to the board of W. H. Allen Sons & Company, Limited.

Mr. P. B. TUCKER, managing director of Craven Bros. Crane Division, Limited, has been appointed to the board of the parent company, Herbert Morris, Limited.

Mr. F. BULL, manager of the Nottingham branch of W. T. Henley's Telegraph Works Company, Limited, since 1946, has been presented with a gold watch to mark his 40 years' service with the firm.

Mr. G. F. H. HEMSLEY has been appointed an additional member of the board of Vickers-Armstrong (Aircraft), Limited. He will continue to hold his present appointment as chief engineer, aircraft.

Mr. DUNCAN G. BAILEY, O.B.E., chairman of S. J. Claye, Limited, a wholly-owned subsidiary of Charles Roberts & Company, Limited, wagon builders, etc., Horbury, Yorkshire, has relinquished that post but will continue as a director.

Mr. GEORGE ARMSTRONG, of Joliet, USA, who has been appointed manufacturing manager for Britain by Caterpillar Tractor Company, Limited, will co-ordinate the manufacturing activities of the firm's factories at Tannochside, Newcastle and Leicester.

Mr. DOUGLAS E. GRAHAM, managing director of James Archdale & Company, Limited, has been appointed a director of the parent company, the Staveley Coal & Iron Company, Limited. He is vice-chairman of the Council of the Institute of Export.

Mr. ROBERT D. UMPLEBY, who since 1942, has been director in charge of piston-ring production at Hepworth & Grandage, Limited, Bradford, retires this month after 36 years' service with the company. He will continue to act in a consultative capacity.

Mr. A. K. MCCALL has been appointed chairman of Churchill-Redman, Limited, machine-tool makers, Halifax, in succession to Mr. J. B. S. GABRIEL who has retired. Mr. G. K. E. MCCALL has been appointed managing director in succession to Mr. A. K. McCall.

Mr. F. L. TURNBULL, formerly director and works manager of Armstrong Whitworth (Metal Industries), Limited, has become director and general manager. Mr. R. H. PHILIP, formerly director and secretary, has been appointed commercial director and secretary. These changes follow the retirement of Mr. CHARLES PULLAN as sales director of the company.

Mr. CHRIS HOLDEN, director and secretary of Chris Holden, Limited, Bank Top Foundry, Blackburn, has been re-elected as president of Blackburn Chamber of Commerce, for a second year of office. He has represented the Chamber on the Blackburn District Committee of the North-West Regional Board for Industry for eight years and was chairman for five years.

Alderman GEORGE CLAVERING HALL, J.P., of Peterborough, chairman of J. P. Hall & Sons, Limited, engineers, London Road, Peterborough, is one of three new Freemen of Peterborough elected by a special resolution of the Town Council. Alderman Hall has been a councillor for 32 years, an alderman for 19, and a magistrate for 18. He was Mayor of Peterborough in the Coronation Year 1937-8.

Mr. A. S. DICK, managing director of Standard-Triumph International, Limited, has been appointed a governor of the College of Aeronautics, Cranfield, on the nomination of the Society of Motor Manufacturers and Traders. The appointment results from the Ministry of Education's provision for representation of the motor industry now that the College is establishing an advanced school of automobile engineering.

Mr. E. N. GRIFFITH has been elected vice-president of the British Engineers' Association, after having served on its governing council for the past 10 years as representative of the Agricultural Engineers, Association. Mr. Griffith who was president of the Agricultural Engineers' Association from 1948 to 1954, is chairman and joint managing director of Rotary Hoes, Limited, West Horndon (Essex), and a governor of the National College of Agricultural Engineering.

For the rescue of a workman from the bottom of a soaking pit at Stewarts and Lloyds' iron and steel works at Bilston, Mr. SIDNEY YORKE has been presented with a chiming clock by the company. The man he rescued was Mr. Jesse Slimner, who fell into a pit when the brickwork at the edge crumbled. Mr. Yorke grabbed a ladder, went down into the pit and climbed out with his workmate over his shoulder. The citation says: "There is no doubt that Mr. Yorke showed considerable presence of mind and initiative in dealing with the situation."

At his own request, Sir WILLIAM GARRETT has relinquished his executive responsibilities with Monsanto Chemicals, Limited, in order to devote more time to his other interests. He will continue as a member of the board. Since 1957 Sir William had, among other executive duties, held the position of personnel director of Monsanto Chemicals. These duties will now be assumed by Mr. N. F. PATTERSON, director in charge of engineering and purchasing. Sir William is chairman of the Association of British Chemical Manufacturers and a director of Metal Industries, Limited.

Recent Wills

CADMAN, MAJOR W. H., well-known authority on carbon black £61,800

GREENE, C. J., formerly of Callender's Cable & Construction Company, Limited £73,048

TUCKER, EDWARD, a director of Beal & Son, Limited, anchor and chain makers, of Cardiff £27,826

JAMES, T. C., chairman and joint managing director of the Wolverhampton Metal Company, Limited, James Bridge Copper Works, Limited, Barton Williams & Company, Limited, and Hayes Metals (Gloucester), Limited £185,053

BURKESS, T. P. N., chairman of Ambrose Shardlow & Company, Limited, dropforgers, etc., of Sheffield, and a director of the Asquith Machine Tool Corporation, Limited, and former joint managing director of William Asquith, Limited £28,536

THORNHILL, W. T., retired works manager, late of Rubery Owen & Company, Limited, manufacturing and structural engineers, etc., of Wednesbury (Staffs), and a director of its Oldbury (Worcs) subsidiary, Hudson Brown, Limited... £37,629

Notes from the Branches

London

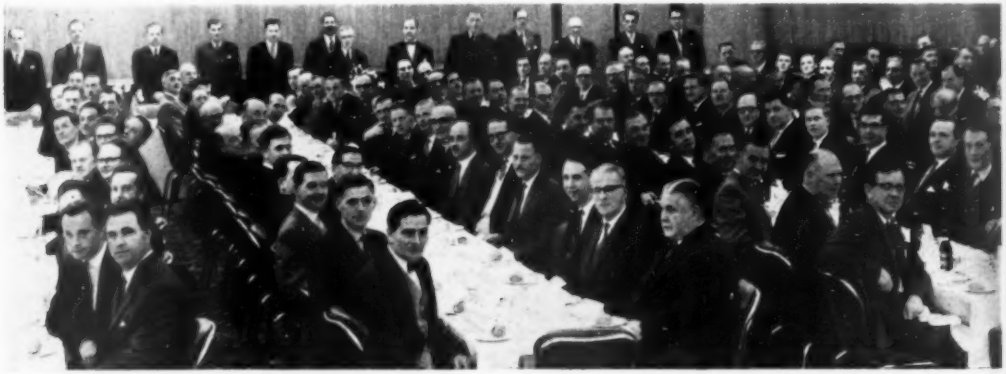
On April 8 the annual "Men Only" dinner of the London branch of the Institute of British Foundrymen was even more a domestic affair than usual, in that none of the national officers of the Institute were present to grace the occasion. The opportunity was taken, however, to bring into prominence as "guests" the presidents and secretaries of the branch's sections, as well as a sprinkling from the general membership in these somewhat remote areas. The total attendance of 200 was made up also by personal guests of London-area members. All congregated in Lyons' Corner House, Tottenham Court Road, for a highly-successful function in which informality was the key-note. Mr. J. Bain, A.M.I.MECH.E., the London branch president, expressed a special welcome to the officers and members from the sections and Mr. T. D. Oughton, president of the East Anglian section (the oldest section of the branch), responded. The evening continued with carbaret provided by John Gower, Jack Train and Linda Mason, and Mr. Barrington Hooper was prevailed upon to tell a few "stories," as a contribution to the amusement of members and guests.

Stoke-on-Trent Section

The Stoke-on-Trent section held its fourth annual general meeting on April 7 at the Grand Hotel, Hanley, when the following officers were elected:—as *president*, Mr. James Foster Dowell; as *vice-president*, Mr. B. Cordall; and as *hon. secretary*, Mr. Jack Bailey. Members elected to Council were Mr. B. Hardman, Mr. L. Mayer, Mr. A. Barton, Mr. S. Lee, Mr. H. Stubbs, Mr. J. Shaw, Mr. C. Edge, and past-presidents, Mr. R. Lewis, Mr. E. Smith and Mr. G. H. Charsley.

Mr. Dowell, the new president of the section, is foundry manager of Cowlishaw Walker, Limited, Stoke-on-Trent, a position which he has held for the past 10 years. He was apprenticed to the foundry industry in Glasgow, and also received his technical education in that city at the Stow Technical College, where he obtained his City and Guilds certificate in foundry practice.

Photographs taken during the London branch "Men Only" dinner. Standing at the top table, from left to right, are Mr. D. A. C. Hutchison, Mr. K. Bolton, Mr. R. J. Bown, Mr. S. J. Williams, Mr. T. D. Oughton, Mr. L. A. S. Harbourne (compère), Mr. J. Bain (president), Mr. G. R. Webster, Mr. Barrington Hooper, Mr. F. A. Wilson, Mr. W. D. Hartley, Mr. B. Levy and Mr. E. C. Rowen. The other photographs are of informal groups at cocktail time.



Group photograph taken at the inaugural dinner of the recently-formed Natal section of the IBF, to which members of the South African branch were invited. From left to right: Mr. A. Johnson, Mr. F. Rice, Mr. D. Russell, Mr. J. Steele (hon. secretary, South African branch), Mr. J. Robertson (president, Natal section), and Mr. D. Gordon Jones (senior vice-president, SA branch).

Bristol

The Bristol and West of England branch of the Institute held its annual dinner/dance at the Royal Hotel, Bristol, on March 19, Mr. F. K. Vickery branch president, presiding. Mr. Vickery in proposing the only toast of the evening—that of "The Institute of British Foundrymen"—welcomed the visitors and especially Mr. C. H. Wilson, national president, who, he said, despite a very exacting programme had managed to be present that evening. Responding, Mr. Wilson said he found it most agreeable that it had been possible to come to Bristol; it was the kind of Institute event that he found particularly enjoyable. He then referred to his interest in the work of the Institute and the branches, particularly mentioning the recruitment and training of apprentices. This, he said, was the one subject on which he felt some disappointment. Although there were many apprentices who appeared to have excellent technical and practical qualifications, only a few of those who entered the national foundry apprentices' competition organized by the Institute, had a standard of attainment which was acceptable for the European Foundry Apprentices' Competition. He hoped that members, either as employers or employees, would give thought to what could be done to improve the situation. After paying tribute to Mr. D. A. Richards, national junior vice-president and a member of the Bristol branch, for the support he had given him as president, Mr. Wilson then presented the Buchanan silver medal to Mr. J. L. May (who was with Mr. Richards' company) for his success in the 1959 final examination of the City and Guilds of London Institute. The evening concluded with an entertainment by Harold Poole followed by dancing to Arthur Alexander and his orchestra.

Scottish

The annual general meeting of the Scottish branch was held on March 12 at the Royal College of Science and Technology, Glasgow, the branch president, Mr. John B. McGregor, presiding. During the course of the meeting, the national president, Mr. C. H. Wilson, presented the prizes to the John Surtees memorial competition winners. A most interesting lecture, "Manual or Automatic," by Mr. R. H. Garner, B.SC., concluded the afternoon's proceedings.

In the evening the branch held its annual dinner at the Grosvenor Restaurant, Mr. McGregor again presiding. The first toast was that to "The City and Corporation of Glasgow," proposed by Mr. W. S. Jolley, to which Bailie Alexander Hart, O.B.E., replied. Professor E. C. Ellwood of the Royal College of Science and Technology proposed the toast of "The Institute of British Foundrymen." Mr. Wilson, in replying, commented on the marked discrepancy between the standard achieved in the John Surtees memorial competition and the general standard of the competitors in the national foundry apprentices' competition organized by the Institute. The Scottish branch, he said, had been fortunate in the entries received for their competition, and he regretted that competitors for the John Surtees standard had not entered for the national competition.

The Scottish branch president, Mr. John B. McGregor, responded to the final toast of "The Scottish Branch," proposed by Mr. G. Lambert, secretary of the Institute, and entertainment was then provided by Mr. George Bryden (tenor), and Mr. Joseph Gorman, jnr. (baritone), who were accompanied by Mr. William Findlay.

Natal Section

At the meeting of the Natal section held in January in Durban, Mr. G. Thompson presented his paper "Lead/Tin Patternmaking." Patterns for demonstration were loaned by the Durban Falkirk Iron Company. In giving his paper Mr. Thompson pointed out that he had chosen a simple theme to encourage other members of the section to prepare papers. He said that every member had his own theories on various topics, and these could form the basis of a paper. After a vigorous discussion, the branch president, Mr. J. Robertson, proposed the vote of thanks. The evening was rounded off by the showing of a film on s.-g. iron, supplied by the Nickel technical information office.

Tees-side branch of the Institute of British Foundrymen has elected Mr. F. W. POTTS, works manager of Cochranes (Middlesbro') Foundry, Limited, as president, Mr. T. HURST, of the Darlington Forge, Limited, senior vice-president, and Mr. G. F. TAYLOR, a director of Head Wrightson Steel Foundries, Limited, junior vice-president.

NSMP Annual Dinner

Businessmen in the South of England who are associated with patternmaking and the foundry industry and who would like to attend the annual dinner/dance organized by the National Society of Master Patternmakers, to be held at the Grand Hotel, Brighton, on Saturday, May 21, are invited to write to the secretaries, Fisher & Firkins, 12, Cherry Street, Birmingham, 2. Accommodation booking should be made direct with the hotel.

David Brown Jackson Division completes Outstanding Contract

The ability rapidly to reorganize and enlarge its gear-cutting facilities, revise production schedules, and call upon the co-operation of associated companies, recently enabled the David Brown Jackson division, of Salford, to complete—on exceptionally short delivery terms—an order for sets of unusually large gearing, which forms part of a sugar plant of British design destined for Russia.

The order, placed by Duncan Stewart & Company, Limited, Glasgow, covered the supply of eight sets of combined gear-and path-rings, with pinions. Gear dimensions ranged from 21 ft. 2 in. to 23 ft. 11½ in. dia., the eight sets of path-rings varying in size from 20 ft. to 22 ft. 9 in. The 24 items involved a total weight of 380 tons. To produce gearing to these sizes in the short time allowed, the opportunity was taken to extend the range of one of the firm's large hobbing machines (of 16½-ft. maximum capacity) to accommodate gears up to 32-ft. dia., 10 ft. face width, 70 tons weight, and 4 in. circular pitch (see Fig. 1). As such, this machine is now the largest of its type in Britain and probably in the world.

Steel Casting

The path rings comprised four cast-steel segments (Fig. 2), these being made at the David Brown Foundries division, in Penistone, near Sheffield. In addition to producing certain castings, this company also made patterns for other suppliers of castings. By spreading and at the same time co-ordinating the supply of castings in this way, it was possible to complete the alterations to the hobbing machine by the time final machining had been carried out and the rings prepared for cutting. Some idea of the magnitude of the cutting operation may be gauged from the fact that 15½ tons of metal were removed from the eight path- and ring-gears alone. The entire operation, including actual gear-cutting, was completed within six months.

Master Patternmakers to visit Italy, in September

Following a visit to Milan by Mr. Eric Rowen, president-elect of the National Society of Master Patternmakers, accompanied by Mr. R. Mousley, it has been arranged with Dr. Lo Pinto, director of *Associazione Italiana di Metallurgia*, that a visit of NSMP members to Italy should take place from Monday, September 12 to Saturday, September 16. The following tentative programme has been established.

September 12. Arrive in Milan.

September 13. Visit to the Science Museum; meeting with the officers of the host organization; inspect the foundry and engineering exhibits; visit Ferrari—the largest master-patternshop in Milan specializing in metal equipment for motor and similar castings. If time permits, a visit will be paid to other patternshops. In the evening, the hosts (together with their ladies) are issuing an invitation to an informal dinner.

September 14. Day visit to Turin where the works of Samma—the largest patternshop in Italy—is being opened for inspection. Later, the foundries and patternshops of the Fiat Company will be toured.

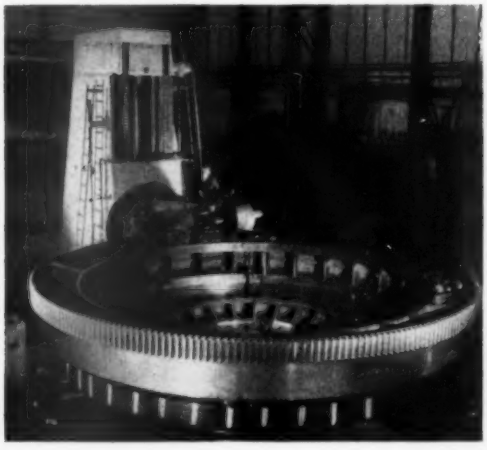
September 15. Day visit to Genoa, when a visit to the patternshop and iron and non-ferrous foundries of Ansaldo (specializing in naval propellers) has been arranged. After luncheon, two small master-patternshops will be toured.

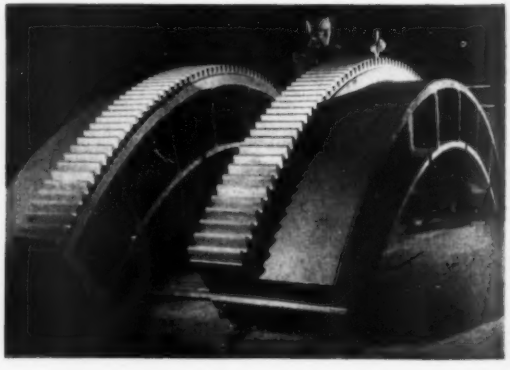
September 16. Visit to an art foundry in the Milan area and the "Certosa"—a monastery at Pavia. After luncheon, a visit will be made to the patternshop and malleable foundry of Necchi, where sewing-machine castings are produced.

September 17. Free for personal pursuits, but if desired, further visits can be arranged.

NSMP members desirous of being included in this interesting trip should write to the secretaries, Fisher & Firkins, 12, Cherry Street, Birmingham, 2. (Any other master-patternmakers who would like to participate in this or any other activities of the Society should enquire about membership from the secretaries.)

FIG. 1 (*left*).—*Hobbing a combined path- and ring-gear, on a machine of which the capacity has been increased from* 16½ *to* 32 *ft. dia. by the David Brown Jackson division, of Salford.* FIG. 2 (*right*)—*Checking the finished segments for a large combined path-ring and gear, part of a large order for sugar-plant gearing. This particular gear measures* 23 *ft.* 11½ *in. dia.,* 2 *ft.* 8½ *in. face width, and has* 256 *teeth of* 3½ *in. c.p. The segments, each weighing* 6 *tons,* 18 *cwt. were made at the David Brown Foundries division, in Penistone.*





Parliamentary

Apprentice Training Scheme

A small number of classes in Government training centres are to be set up to provide first year apprentice training, said MR. EDWARD HEATH, Minister of Labour. He added that the training would be given only to boys accepted as apprentices by firms. Preference would be given to boys from firms which were either unable to undertake apprentice training or to increase their present number of apprentices.

The training would be free of charge, but employers taking part in the scheme would be required to give an undertaking to pay the wages of apprentices during the year and to continue the boys' training afterwards under normal industrial arrangements.

"This scheme has been approved as a whole by the British Employers' Confederation and the Trade Union Congress," he said. "The establishment of classes in engineering has been agreed by the employers and trade unions in that industry." The first training places would be available early this summer at eight Government centres and he expected to set up classes at other centres later this year, making a total of about 300 training places.

ECSC Steel Output

Output of crude steel (ingots and castings) in the European Coal and Steel Community last month rose sharply to an all-time record of 6,382,000 *tonnes*. This was not only about 500,000 *tonnes* more than the February figure and 1,500,000 more than in March, 1959, but the first time the Community's monthly output has exceeded 6,000,000 *tonnes*. The previous record was 5,992,000 *tonnes* in October last year. All six community countries broke previous records.

Pig-iron and ferro-alloys output in March was also a record at 4,685,000 *tonnes*, against 4,328,000 *tonnes* in February and 3,680,000 *tonnes* in March last year. The previous record was 4,416,000 *tonnes* last January. Once again, all community countries surpassed their previous records.

A report on French steel prices shows that of steel grades exported to other members of the Community, prices rose from April 1 by an average of 6 to 6½ per cent. Earlier it was stated that the average increase in all steel prices (including those for domestic sales) was 4½ per cent. The suggested increase of 8 per cent. has not been reached and French prices are still the lowest in the Community.

ICT Computer Demonstration

A demonstration of automatic job-scheduling by electronic computer is to be given on the International Computers and Tabulators, Limited, stand (No. 74) at the Production Exhibition to be held at Olympia, London, from April 25 to 30. The speed, storage capacity and logic of the ICT type-1202 computer will be illustrated by simulating the production situation in a hypothetical engineering factory. Visitors to the stand will be invited to play the rôle of potential customers who want to know the earliest date by which the factory can meet their orders and what the cost will be. The computer will give the answer in a matter of seconds. A production and performance recording system for use in factory and plant control will also be on show. This equipment, attached to any number of machines or processes, can provide automatically and continuously, at a central location, details of output, total idle time per machine per shift, causes of stoppages (including date and time) and the order number on which each machine is engaged.

Ironfounding Production in 1959

Discussing ironfounding production in 1959, the Council of Ironfoundry Associations states that although there was a recession in ironfounding at the beginning of the year, by the end of 1959 there were signs of marked improvement and production in iron foundries approached record rates. The total production figure of 3,489,000 tons, whilst considerably lower than the record 3,925,000 tons produced in 1955, nevertheless showed foundry prospects in a more cheerful light than could have been reasonably expected at the end of 1958. Actually in the fourth quarter, total output at 989,000 tons approached the record rate for any year since accurate statistics became available. Although progress in the various sections had not been uniform, the year closed with only the railway-equipment section not being able to record an increase in the production rate.

As to the other sections, production of castings by the automobile industry had provided a remarkable exception to the general trend, in that it began 1959 with production already running at a high rate. As the year progressed, output rose still higher, and for the year as a whole exceeded the 1958 tonnage by 23 per cent. Output in the building section rose steadily through the second and third quarters, reaching a record figure in the fourth quarter—castings production for domestic goods (stoves, ranges, refrigerators, etc.) well exceeded that of the previous year. A good third quarter and a sharp rise in the fourth brought production of pressure pipes and fittings for the year to a significantly higher level than had been achieved in 1958. Ingot-mould output, in sympathy with steel production, rose sharply in the second half of the year.

The experience of the engineering sections has been variable. In general, recovery began slowly and was confined to the last quarter of 1959 when output began to rise noticeably for machinery castings, such as those for machine-tools, paper, electrical, agricultural and textile machinery. That there was only a small recovery in the demand for castings for heavy plant and equipment, ships, prime mover and industrial boilers, no doubt, says the CFA, reflects the experience of the section's principal customers—the capital equipment industries—many of which were only just beginning to feel the effects of recovery in capital investment, which appears to have been taking place since the beginning of the fourth quarter of 1959.

Finally, the CFA comments that there are signs that the first three months of 1960 will prove to have at least maintained the 1959 output.

JIC Annual Banquet

As recently reported in the JOURNAL, the annual banquet of the Joint Iron Council is to be held in the Guildhall, London, on November 1. The Lord Mayor of London has signified his intention to be present, and a record attendance is expected. The necessary forms for reservation of tickets are to be sent out on August 19, and in case it happens that those who are responsible for ordering their company's tickets are on holiday at that time, the Council suggests that these people might like to consider leaving instructions at their offices so that prompt return may be made to the JIC of their requirements.

NORTH BRITISH RUBBER COMPANY, LIMITED—Mr. Edward J. Higgins has been appointed to the board. He succeeds the late Mr. Ludwig C. Boos.

Salter's Bi-centenary

Force majeure, there are but few precedents to call upon for the celebration of bi-centenaries of industrial firms, but sufficient of them exist to establish a few prerequisites. There must be the widest publicity for the occasion and a book should be published to record the history of the firm's activities. To celebrate their bi-centenary, Geo. Salter & Company, Limited, the great light-engineering firm, created much interest in the event by inviting a wide cross-section of the Press and taking them from their hotels a distance of several miles to West Bromwich by stage coaches. Towards the destination, the pavements were thickly lined by a cheering crowd. The dinner, held that evening, was served in a candle-lit hall, and emulated with consummate skill, and with a minimum of anachronisms, a Georgian banquet. The hotel staff and the madrigal singers were dressed in the style of the period and with the brandy—not whisky, as that was virtually unknown in England at that time—came churchwarden pipes and jars of tobacco. It was a great evening, the memory of which will long be retained by those fortunate enough to participate.

The next morning, the Press were shown over the various sections of the company's modern works. Shortly, a football match is to be played on the works' sportsground between the house eleven and West Bromwich Albion team (which virtually had its birth in the Salter works). This is a very suitable event, as the book detailing the history of the works does underline how for many decades the owners of the works were outstanding sportsmen and enthusiastic supporters of the local civic government and the Church.

The firm is not and never had primarily been a foundry concern, but started and continued as manufacturers of machines incorporating springs. Their interest in foundries only started about 75 years' ago.

Technical Teaching as a Career?

Awards at the 1958-59 session prizegiving of the Sheffield College of Technology Science Department were made by Mr. G. L. Bailey, director of the British Non-Ferrous Metals Research Association, who asked students to consider the career of teaching in technical colleges. He said that unless some students took a real interest in teaching, difficulties would arise in staffing technical colleges.

Mr. D. Thacker, head of the department, said that the outstanding development of the session had been the commencement of a three-year sandwich course leading to the higher national diploma in metallurgy. "We have established ourselves as a leading centre for advanced teaching in metallurgy," he added.

It was reported at the prizegiving that an increased number of students took examinations at the end of the advanced courses, and at all levels the standards of the department were maintained with a total of 252 successes. Next session the department is to offer various new courses, including one leading to the ordinary national certificate in applied physics.

Mr. David Robinson, 25-year-old laboratory technician at the College of Technology, was an outstanding award winner. In 1957 he was awarded the City and Guilds bronze medal as the best student in the country in their intermediate examinations in laboratory technicians' work. Last year, he took the final examination, and again became the best student nationally, gaining the silver medal.

"Unions and Rebels"

The Executive Council of the Amalgamated Engineering Union has sent out a circular to all its 10,000 shop stewards warning them to take no part in unofficial strikes or other unofficial action. This instruction reinforces the message—to the same effect—sent out recently by the General & Municipal Workers' Union.

These unions realize the great harm that is done by spur-of-the-moment striking, and that these strikes yield no profit in most cases. Any material gains they may secure are offset by loss of earnings, delays on work and peril to future orders. If every union in the country made it absolutely clear that they would take action against those who persisted in unofficial action, a lot more work would be done—more efficiently. But where there is a demand for more discipline, the unions should take a stand against an over-strictness that becomes dictatorial, such as against the closed shop, and the hostility towards men who have objections to entering the union. This practice, with its "angry silence," its "sending to Coventry," is unworthy of the trade unions. It is a flat denial of the freedom they were set up to fight for.

(The above statement, sent by the JOURNAL's Scottish correspondent, undoubtedly reflects opinion expressed in a local newspaper, but it will probably be endorsed by all forward-thinking individuals—Editor.)

Steel, Peech & Tozer to Instal APIC

An automatic power-input controller (APIC) designed by the British Iron and Steel Research Association, is to be installed by the Steel Peech & Tozer branch of the United Steel Companies, Limited, on its 5-ton furnace. APIC works the furnace according to a controlled programme of time and roof temperatures.

The equipment consists primarily of a synchronous electric timer and devices which continuously measure the temperature, and rate of temperature change, of the roof refractories. When the information relayed by these instruments indicates that a particular stage of melting has been reached, the controller selects the appropriate voltage for the next stage of the programme.

The company has used the prototype APIC on a continuously operated 5-ton arc furnace. A three weeks' trial under observed technical control, followed by a further two months' trial under normal operating conditions, has shown reduced electricity consumption, improved melting rate, and some indication of a reduction in roof wear. The company is now building an APIC for permanent use so that the prototype can be released for trials at other works.

The use of large electric-arc furnaces for the bulk production of steel is increasing and the company announced recently that its 21 open-hearth furnaces are to be replaced by six 110-ton electric-arc furnaces. This will be the largest electric steelmaking plant in the world.

A Cast Visiting Card

Rice & Company (Northampton), Limited, are providing their commercial representatives with visiting cards taking the form of thin shell-moulded grey-iron castings. They are an effective form of publicity.

Mr. A. SYKES, secretary of the Cutlers' Company, told the history of the company to members of Retford Townswomen's Guild when they visited the Cutlers' Hall, Sheffield, on April 5. He said the company was formed in 1642 and although not wealthy, it had always been charitable and to-day organized 15 charities.

News in Brief

BRITISH ALUMINIUM COMPANY, LIMITED, are to build a storage house at a cost of £2,000 at their Bainsford rolling mills, Falkirk.

FALKIRK BRASS & SANITARY ENGINEERING COMPANY, LIMITED, have transferred to new premises at Mungalend Works, Bankside, Falkirk.

PLANS HAVE BEEN APPROVED for a £29,000 workshop to be built by M. Cockburn & Company, Limited, ironfounders, at Gowanbank, Falkirk.

THE BRITISH STEEL CASTINGS RESEARCH ASSOCIATION, Sheffield, recently held a four-day refresher course on moulding materials—the fifth of its kind to take place since December, 1957.

THE FOURTH PRODUCTION EXHIBITION will be held in the National Hall, Olympia, London, from April 25 to 30. The exhibits will accent advanced methods of production in many industries.

SCOTTS' SHIPBUILDING & ENGINEERING COMPANY, LIMITED, Greenock, announce that they have completed a licence agreement with Sulzer Bros., Limited, Winterthur, Switzerland, to build Sulzer-type marine engines.

HARLAND ENGINEERING COMPANY, LIMITED, has secured a contract, worth about £375,000, from the Midland group of the Central Electricity Generating Board, for four groups of boiler-feed pump sets for the Drakelow C power station.

FOUR OF THE SEVEN PRIZES awarded annually in the national John Surtees Memorial Competition were won by students of the Burnbank School of Engineering. Three of the successful students are apprentices of the Clyde Alloy Company, Limited.

ASSOCIATED ELECTRICAL INDUSTRIES, LIMITED, are to supply electric-traction equipment to South Africa for South African Railways to the value of nearly £2,750,000. Most of the apparatus is to be made at the Trafford Park, Manchester, and Sheffield factories.

THE BIRMINGHAM PRESSURE-DIE-CASTING COMPANY, Ingall Parsons Clive and Company, Limited, have acquired the whole of the issued share capital of Taylor & Osborne, Limited, Perry Barr, Birmingham. The latter company was established 120 years ago.

A FACTORY for assembly of electric cookers is to be built at Peterhead by Scottish Industrial Estates for Radiation, Limited. It is expected to be ready in about six months and will employ between 30 and 40 local people initially; the ultimate labour force will be about 100.

TEN APPRENTICES of Newton Chambers & Company, Limited, who are on National Service, attended the firm's annual Good Friday tea-party in the board room. They were handed hot-cross buns by Mr. P. J. C. Bovill, the Master Cutler, who is managing director of the firm.

THE DISTILLERS COMPANY, LIMITED, Devonshire House, Mayfair Place, London, W.1, announce that following completion of their film on the use of the CO$_2$ Process, they have prepared a small booklet "Hard and Fast" which will in future be available for audiences seeing the film of the same title.

W. H. PAUL, LIMITED, Breaston, Derbyshire, announced last month that they have suspended production of radiant oil-heaters pending the issue of new British Standards specifications. They have informed dealers that when the new standards are issued, they will guarantee to modify all existing heaters, if possible free of charge.

PRESSED STEEL COMPANY, LIMITED, who already manufacture railway rolling-stock at their Linwood, Paisley, works, are to lay down a new extension for car-body production there. The new extension is part of a considerable development programme which Pressed Steel have announced for their various plants in England and Scotland.

BARWORTH STEEL WORKS, LIMITED, has been registered with £50,000 capital to carry on business of iron founders, steel manufacturers and merchants, steel converters and refiners, etc., with offices at 145, Carlisle Street, Sheffield. The directors are Mr. Reginald Hulley and Mrs. Phyllis Hulley, Mrs. Elsie M. Worthington, and Mr. Clifford Thornton.

A RECREATION HALL costing £10,000 is to be built for the 3,000 Africans living at Que Que, the Southern Rhodesia steel centre. The hall, to be built in three stages, will include a main hall with full-size badminton court, a stage, dressing rooms, cloakrooms, kitchen, and confectionery counter. A contribution of £5,000 has been made by the Beit Trustees.

A CHANGE OF VENUE is announced for the symposium on the "Determination of Gases in Metals," organized by the Society for Analytical Chemistry in conjunction with the Iron and Steel Institute and the Institute of Metals (and reported in the JOURNAL, March 17 issue). It will now be held at Denison House, 296, Vauxhall Bridge Road, London, S.W.1, instead of Church House, Westminster.

BUTTERLEY COMPANY, LIMITED, Derby, are to manufacture 90-ft. high units for perpendicular car parks. The car parks, designed by a Swiss engineer, and based on the principle of the big wheel of the fun-fair, contain 40 cars over ground space of six cars and a car can be lowered from the 90 ft. top in 90 seconds. The unit can be moved quickly and adapted for enclosure in any shape of building.

TO SERVE the south Lancashire area, new scrap works and office block of Thos. W. Ward, Limited, engineers, ironfounders, metal merchants, etc., of Sheffield, was opened by the chairman, Mr. H. W. Secker, at Salford, on April 11. Accompanying Mr. Secker were the deputy chairman, Mr. Arnold Carr, and Mr. J. S. Bradshaw, Mr. W. Hall, and Mr. D. F. Walton, directors of the company.

AMONGST EXHIBITORS at the German Industries Trade Fair, which is to be held in Hanover from April 24 to May 3, will be Simmonds Aerocessories, Limited, a member of the Firth Cleveland group, who will be exhibiting in conjunction with their subsidiary, Deutsche Firth Cleveland G.m.b.H. Five major aircraft control and measuring systems designed by Smith's Aviation Division will also be on show.

THE DONCASTER FACTORY of the Ford Motor Company, Limited, will eventually build all the company's Popular models. The complete production of this car is being gradually transferred from the Dagenham plant to Doncaster, leaving the latter works free to cope with the tremendous demand for Anglias. At the present time 100 Populars per day are built at Doncaster and 90 at Dagenham.

A NEW highly-automatic ore-milling plant has been opened by the International Nickel Company of Canada, Limited, in the Sudbury area of Ontario. The mill is among additions and improvements the company is carrying out at its properties in the area which, with the new nickel-mining project being developed at Thompson, Manitoba, will raise Inco's

News in Brief

nickel production capacity to 385,000,000 lb. per year by 1961.

NATIONAL CASH REGISTER COMPANY, LIMITED, are to add 120,000 sq. ft. of manufacturing space at Dundee Industrial Estate to cope with expanding work. The Industrial Estates Management Corporation for Scotland will build the factory, work starting in May. Completion is expected within 15 months. This further plant continues the steady expansion of National Cash Register since their location in Dundee some years ago.

ENGLISH ELECTRIC COMPANY, LIMITED, have secured an order worth £2,500,000 for hydro-electric generating plant for two new Spanish power stations on the Tagus, against strong European competition. Three 108,000 h.p. turbines, which it is said will be the most powerful in the world, will be built at Netherton, near Liverpool. The company has also announced that it is to supply 20 more 2,000-h.p. type 4 diesel-electric locomotives to British Railways.

A WORKS VISIT to Millspaugh, Limited, Alsing Road, Sheffield, on May 3, has been arranged by the Association of Bronze & Brass Founders for members in the Lancashire and Cheshire area. The visit will be preceded by luncheon at the Royal Victoria Hotel, Sheffield, at 12.30 p.m., and arrival at Millspaugh is scheduled for 2.30 p.m. Members wishing to attend should apply to the secretaries, Heathcote & Coleman, 69, Harborne Road, Edgbaston, Birmingham, 15.

THE ANNUAL CONFERENCE of the *Bureau International de la Recuperation* (International Waste Trade Federation), organized jointly by the Waste Trade Federation, National Federation of Scrap Iron, Steel and Metal Merchants, the National Association of Non-ferrous Scrap Metal Merchants, and the Waste Paper Merchants Association, is to be held at the Park Lane Hotel, London, from May 31 to June 2. The event will conclude with a banquet at the Savoy Hotel, London.

LANCASHIRE DYNAMO, a member of the Metal Industries group, has received through its Central African company, an order for six 1,500-h.p. 11 kv., water-cooled, synchronous motors for driving main drainage pumps at the Bancroft Mine in Northern Rhodesia. Another company in the group, J. G. Statter & Company, Limited, is to supply 11 kv. metal-clad 350 mva. rupturing capacity switchboards for the Durgapur steelworks in India. This follows a similar order placed earlier in the year.

SHEFFIELD'S CHOSEN "APPRENTICE OF THE YEAR" will this year be given a fortnight's stay in Stockholm. He will be the guest of the Stockholm Junior Chamber of Commerce and will be entertained in members' homes. On the reciprocal basis of the scheme, an apprentice from Stockholm will come to Sheffield to be the guest of the Sheffield Junior Chamber of Commerce. Sheffield entries for the selection are now being received from industry and commerce and a final six will be selected for interview by a panel of leading Sheffield industrial and commercial leaders.

THREE SPECIAL UNIVERSITY LECTURES in metallurgy are to be given by Professor R. Schuhmann, Professor of Metallurgical Engineering, Purdue University, Indiana, in the Metallurgy Lecture Theatre of the Royal School of Mines, Prince Consort Road, London, S.W.7. The first, commencing 11.15 a.m., on April 26 will be on the "Role of the Engineering Sciences in Engineering Education"; the second on "Metallurgy, Materials Sciences and Engineering" will be given in the afternoon of the same day at 3.30 p.m. The last lecture, entitled "The Anatomy of Extractive Metallurgy," will be given on April 27, at 3.30 p.m.

AT THE annual general meeting of the Pig Iron Merchants Association held last week, the following officers were elected:—*As chairman*, Mr. R. W. Neale, J. C. Abbott & Company, Limited; *as vice-chairman*, Sir Charles V. Fitton, Parson & Crosland, Limited; *as hon. treasurer*, Mr. C. A. Parson, Parson, Limited, and *as secretary*, Mr. S. Owen. At the luncheon preceding the meeting, the chairman, Sir Charles Fitton, presented a silver salver to Mr. F. Arnold Wilson, as a token of esteem from his colleagues in the PIMA. Mr. Wilson was a member of the committee for 13 years and chairman from 1951-1955.

AN INFORMAL DISCUSSION on the differences in productivity in industries in the United States and Great Britain is being held by the Industrial Administration and Engineering Production Group of the Institution of Mechanical Engineers, at 1, Birdcage Walk, London, S.W.1, on April 25 commencing at 6 p.m. Miss D. Paige, one of the co-authors of a report on this subject for the Organization for European Economic Co-operation and the Department of Applied Economics, University of Cambridge, is to open the discussion, and will outline methods employed in measuring productivity and give results concerned with those industries particularly connected with engineering and metal working.

Compressed-Air & Hydraulics Exhibition

More than 54,000 tickets have already been requested for the First International Compressed Air & Hydraulics Exhibition, which is to be held at Empire Hall, Olympia, London, from April 25 to 29. There has also been an unprecedented demand for representation at the Second European Fluid Power Conference, which is to run concurrently (April 26 to 28), over 4,000 seats having been applied for against the sponsors' original estimate of 1,400. Stands which will be of particular interest to founders are dealt with below.

DESOUTTER BROS., LIMITED (*Stand No. 10*): will show a complete range of portable power-tools, including a reversible corner nutrunner, corner nutrunner, corner screwdriver and two new grinders. A version of the Desoutter semi-automatic equipment for multiple stud running will be demonstrated.

JOY-SULLIVAN, LIMITED (Air Power Division) (*34*): display their range of air compressors and pneumatic tools for the first time in public. The principal exhibit will be a two-stage double-acting water-cooled compressor of v-vertical design, and hand-held pneumatic drills will also be available for inspection.

AIR AUTOMATION (*147*): This display will consist of a wide variety of compressed-air actuators or cylinders, pneumatic control valves of all types, blow guns, air-operated vices, air-line accessories and fittings.

T.A.L. NUMATICS, LIMITED (*4*): will be exhibiting a complete range of solenoid-operated, pilot, hand, cam-lever and in-line valves, precision built with a newly-developed metal-to-metal seal. Power presses will be demonstrated, and also the possibilities of air-cylinder and self-centring valves for lifting and positioning.

OIL FEED ENGINEERING COMPANY, LIMITED (*46*): will show their complete range of hose and couplings. Also exhibited will be polythene thread-protectors, an extensible hydraulic link and new "easy-fit" couplings.

Fuel Efficiency Exhibition

This year's Fuel Efficiency & Power for Industry Exhibition will be held in the Grand Hall, Olympia, London, from April 27 to May 6. Many of the stands will be of considerable interest to foundrymen—indeed, many of the exhibitors are themselves founders—and most of these are dealt with in brief in what follows.

JOHN THOMPSON GROUP (*5F*): will be displaying industrial steam-raising plant of all kinds, together with structural steelwork and walling suitable for boilerhouses.

W. C. HOLMES & COMPANY, LIMITED (*4B*): will display their range of dust-collection and control plant, together with examples of a positive air-blower of simplified design.

COCHRAN & COMPANY, ANNAN, LIMITED (*13F*): will be showing their new fully-packaged, oil-fired, high-efficiency vertical boiler, and new Sinupac oil-fired, or solid-fuel-fired, horizontal boiler, together with models of their standard boilers.

GAS COUNCIL (*4C*; *3D*): A fully-working heat-treatment shop will form this exhibit, taking up the whole of the ground floor area of the stand. Above it, furnaces too large for inclusion in the exhibition will be displayed in model form in a lounge.

KELVIN & HUGHES, LIMITED (*6G*): The central feature of this stand will be an auto boiler-control system for shell boilers. Other instrumentation on view will include a system of smoke detection extensively used in foundries, boilerhouses and other industrial applications.

JOSEPH LUCAS, LIMITED (*13C*): will be showing their complete range of high-efficiency hydraulic pumps and motors, a hand-operated torch igniter, a low-pressure oil-burner incorporated in various appliances, and two working displays to demonstrate the efficiency of the Lucas atomizer.

NEWTON CHAMBERS & COMPANY, LIMITED (*1G*): Industrial equipment on show will include a coke-fired boiler, corner tube boiler, a range of heat exchangers and an air pre-heater. The company's range of domestic oil-fired boilers, fitted with a new high-thermal-efficiency burner, will also be displayed.

STURTEVANT ENGINEERING COMPANY, LIMITED (*8B and 11F*): will show equipment concerned with steam raising by the application of mechanical draught techniques and fans of advanced design, for mechanical stoker or oil-fired boilers. Their latest designs of electrostatic precipitators for the cleaning of boiler-flue gases to a high degree of efficiency will also be exhibited.

KEITH BLACKMAN, LIMITED (*1A*): Exhibits will include: Various types of forced-draught fans; a selection of blowers suitable for supplying high-pressure air for combustion to oil and gas-fired furnaces; a high-efficiency cyclone dust-collector; a working model of a shot-cleaning system; a four-stage, 24-in. steel-plate turbo-blower, and a selection of industrial gas-burning and control apparatus.

MORGAN REFRACTORIES, LIMITED (*2C*): will exhibit a range of castable and mouldable refractories that can be fired *in situ*, and yet are claimed to have a performance comparable to that of super-duty pre-fired refractories. Other products on show will include refractory bricks, furnace shapes, assay ware, tubes, sheaths, and high-purity ceramic oxide refractories for use in the temperature range 1,950 to 2,600 deg. C.

CONSOLIDATED PNEUMATIC TOOL COMPANY, LIMITED (*10H*): will be showing a large selection of their range of tube-cleaning equipment, which uses three sizes of air-operated, vane-type motors, in conjunction with a number of types of cutting heads, to deal with straight or curved tubes of from $\frac{1}{2}$ to 24 in. internal dia. Cutter heads and brushes displayed will include cone cutters, swing-frame-type cutting heads, pivoted cone cutters and many types of brushes and straight cutters.

LAFARGE ALUMINOUS CEMENT COMPANY, LIMITED (*12E*): Exhibits will include ignition and stoker arches, burner blocks, flat roof block, furnace doors and lid, combustion-chamber units, sectioned high-duty combustion chamber and samples of the various cements and aggregates. The company will also be showing a new synthetic aggregate called Alag, for use with high-alumina cement, the resultant concrete being claimed to attain superlative qualities of density, hardness and strength in 24 hr.

ELECTRICAL DEVELOPMENT ASSOCIATION (*7C*): will illustrate some of the many ways in which electric-resistance heating is used in industry to give improved production and economy of fuel. The use of industrial electric immersion-heaters for melting metals, and infra-red heated ovens, will also be demonstrated, and space will be devoted to showing how modern electric factory lighting can increase productivity. The warming of stores, offices and workshops by means of underfloor electric floor warming will be the subject of a separate display.

National Industrial Safety Conference

The National Industrial Safety Conference, organized annually by the Royal Society for the Prevention of Accidents, is this year to be held in the Spa Concert Hall, Scarborough, from May 27 to 29. It is to be opened by the Rt. Hon. E. R. Heath, P.C., M.B.E., M.P., and papers will deal with such subjects as the specialist's place in a safety team; the hazards to health caused by excessive noise in industry; difficulties encountered by manufacturers in the processing of chemical substances; the relationship between the safety officer and the engineer; industrial safety and the use of ionizing radiations, and the progress made in accident prevention at the Appleby-Frodingham Steel Company. The presentation of the Sir George Earle trophy will take place during the session on the Friday evening. (This trophy is given annually by the Society for the most outstanding contribution to industrial safety during the preceding year.)

Concurrently with the conference there will be an exhibition of safety appliances in the Spa Café, Scarborough. Enquiries about the conference should be addressed to RoSPA, Industrial Safety Division, 75, Victoria Street, London, S.W.1.

IBF Malvern Conference Fund

The latest contributions to be received by the Council of the Institute of British Foundrymen for its Malvern Conference fund are from Thomas Perry, Limited, Bilston, Staffs (£25), and the Birmingham Small Arms Company, Limited (£25). The Council expresses its appreciation of these donations, and records that a total of £2,555 2s. has now been subscribed to the fund.

Company News

ENGLISH ABRASIVES CORPORATION, LIMITED—Group net profits rose from £43,582 to £93,555 in 1959, and the dividend is increased to 8 (5) per cent.

DARWINS, LIMITED—Trading profits were £444,217 (£350,565), with tax taking £145,400 (£121,400). The final dividend is 8½ per cent., bringing the final to 12½ (10) per cent.

BRITISH PETROLEUM COMPANY, LIMITED—A final dividend of 1s. 6d. per ordinary £1 unit, tax free, making 2s. 2d. net per unit for 1959 is announced, compared with 1s. 9d. net for the previous year when there was a 100 per cent. scrip issue.

F. PERKINS, LIMITED, diesel-engine manufacturers, of Peterborough—Group net profit for the ten months to October 31, 1959, is £1,092,407 (£375,265), after tax of £919,342 (£120,377). As in 1957 and 1958, no final dividend on the ordinary is recommended.

A.P.V. COMPANY, LIMITED, dairy, brewery, chemical, and general engineers, of Crawley (Sussex)—Group net profit was £257,960 (£159,177) and the dividend is 8½ (5) per cent. The profit, before tax, rose from £368,599 to £595,893, excluding the Brazilian subsidiary.

CHURCHILL MACHINE TOOL COMPANY, LIMITED—Net profits were £307,619 (£344,262), after tax of £160,000 (£270,500). The dividend is the same at 2 per cent. but there is a tax-free distribution of 3 per cent. (nil) from realized capital profits reserve, bringing the final payment to 17½ (same) per cent.

BECK & COMPANY (METERS), LIMITED, manufacturing engineers, etc., of London, S.W.16—All the ordinary capital of the Tuscan Engineering Company, Limited, Bridgend (Glam), has been acquired by the company, which is a subsidiary of Hattersley (Ormskirk), Limited. Mr. G. I. Payne continues as managing director of Tuscan.

RANSOMES SIMS & JEFFERIES, LIMITED—The effective dividend of 7½ per cent. is maintained for 1959 on capital increased by one-for-five rights and subsequent one-for-four scrip issues. Adjusting for the capitalization, the 1958 dividend was equivalent to 6 per cent. Net balance was £406,212 (£242,405), after tax of £464,598 (£332,072).

SIR WILLIAM ARROL & COMPANY, LIMITED, bridge builders and engineers, etc., of Glasgow—The less tax dividend is raised by 5 per cent. to 20 per cent. for 1959, with a 12½ per cent. final. Holders also received a 3¾ per cent. payment from capital profits a year ago. A one-for-one scrip issue is proposed to holders of the £593,400 ordinary capital. After all charges, including tax, profits increased from £216,559 to £292,514.

A. V. ROE, CANADA, LIMITED—Business volumes in many markets in which the company, a member of the Hawker Siddeley Group, Limited, is primarily engaged remain at unusually low levels. Most severely affected are rail equipment, airframe, and coal operations. Production of basic steels, the company states, has increased sharply in recent months, and rolling mills and plants producing bars, shapes, and wire are similarly active.

SOUTH DURHAM STEEL & IRON COMPANY, LIMITED—The company states that 1,792 holders of the 6 per cent. convertible second debenture stock 1978/83 exercised their conversion rights during March in respect of £7,510,016 stock. The issue and allotment of 3,755,008 ordinary shares of £1 each is being proceeded with accordingly and 6 per cent. debenture stock certificates to the value of £3,755,008, with no further conversion rights attached thereto, were posted on April 16.

W. H. DORMAN & COMPANY, LIMITED, engineers, etc., of Stafford—Insufficient proxies (64,636 votes in favour and 34,179 against) were received at a meeting of preference holders regarding a proposal that the £400,000 loan, secured by a debenture, and a £79,000 overdraft at March 14, 1960, should be replaced by a more permanent form of finance. At a future date, the board will bring forward more specific proposals for funding the bank loan "so that we may take advantage of the increasing prosperity of the company which would then be reflected in the Stock Exchange quotation for each class of share," said the chairman, Mr. D. Haddon.

FRANCIS SHAW & COMPANY, LIMITED, makers of machinery for the rubber and plastics industries, of Manchester—To finance the expansion of home and overseas business and the recent purchase of Joseph Robinson & Company (Holdings), Limited, it is proposed to raise £450,000 by the issue of 300,000 ordinary 4s. shares and £300,000 6½ per cent. convertible unsecured loan, 1975-80. The ordinary shares and loan stock will be offered to holders in units comprising one ordinary share and £1 loan stock at 30s., a unit in the proportion of one unit for every ten ordinary shares held. Group profit for 1959 was £433,705 (£295,678) after tax of £222,000 (£121,000), and the final dividend is 12½ per cent., making 20 per cent. (17½ per cent. including 2½ per cent. special interim).

Locomotive Order-books full until 1962

Production of locomotives by the Birmingham Railway Carriage & Wagon Company, Limited, continues to expand, reports the chairman, Sir Bernard Docker, in his annual statement. In 1959, the sales value of locomotives exceeded that of the company's other products for the first time.

Locomotive order-books have been filled until early 1962, and the company is fully committed for carriages for about 12 months. Sir Bernard adds that the wagon position still shows no indication of improving.

The valuation of fixed assets started three weeks ago and, Sir Bernard said, should be available in six or seven weeks. The board is awaiting the valuation result before making any recommendation on the merger offer from Charles Roberts & Company, Limited, rail and road vehicle builders, etc., of Wakefield. Sir Bernard states that one or two projects examined for broadening the basis of production were found not entirely suitable. The matter is, however, being energetically pursued.

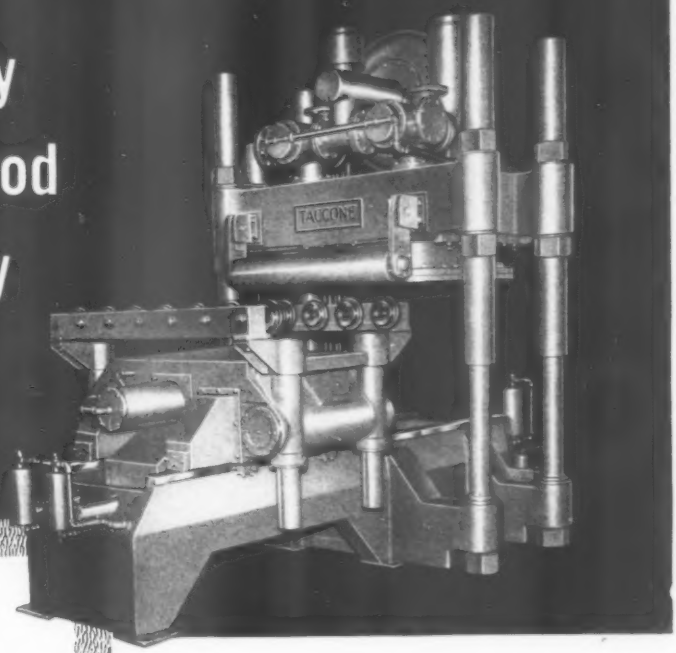
As reported, profit, after tax, dropped from £102,900 to £71,508 and the dividend is reduced to 7½ (10) per cent., but there is this time a 5 per cent. tax free payment from investment sale profits.

Colvilles' Ordinary Share Issue

The directors of Colvilles, Limited, have announced that 4,205 holders of convertible debenture stock exercised their conversion rights during March, 1960, in respect of £5,057,600 stock, and have accordingly issued and allotted 3,540,320 ordinary shares of £1 each. The balance of debenture stock now outstanding is £421,850, and the number of ordinary shares now in issue is 13,915,116.

Permission has been granted by London Stock Exchange to deal in an official quotation for the additional 3,540,320 ordinary shares and the necessary arrangements are being made to apply to the other exchanges which already deal in the existing 10,374,796 ordinary shares for similar permissions and quotations.

An entirely NEW method of Foundry Moulding



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The 'Taccone' machine makes precision green sand pressure moulding available to every foundry. It ensures sound, accurate castings and the moulds it produces are superior to those made by conventional equipment. 'Taccone' moulds are consistently hard and uniform throughout and can be effortlessly produced by unskilled labour.

All types of pattern equipment, including plaster wooden, plastic and metal patterns can be used, and there is practically no limitation on the size of flask employed. 'Taccone' machines are handling flasks 8ft. by 8ft. (larger sizes are envisaged) and already over 200 'Taccone' installations are in operation.

The dimensional accuracy and finish on the castings is comparable with work produced by shell moulding techniques.

The 'Taccone' is more than a machine, more than a process—it is a revolutionary system for rapid mould production.

Ten standard machines are available in the manufacturing range and special machines can be built to any size for any purpose.

For further details of this and other foundry machinery write to:

Baker Perkins Limited, *Engineers*

BEDEWELL DIVISION, HEBBURN-ON-TYNE, Co. DURHAM.

TEL: JARROW 897124

Raw Material Markets

Iron and Steel

During the Easter holiday opportunity was taken of carrying out any necessary minor repairs to plant and cupolas, but there was little if any suspension in deliveries of materials. The supply of pig-iron in all grades is generally satisfactory and apart from delays which ensue due to shortage of stocks at the furnaces and dependence for supplies on production, deliveries are being made to satisfy demands.

Substantial tonnages of low phosphorus irons, together with good quantities of hematite, and, to a lesser extent, the refined irons, are being utilized by the engineering and speciality foundries for their production of high duty castings. Most of these foundries maintain a high level of output, those catering for the motor vehicle trade being exceptionally well employed. Consistent with the labour available, capacity outputs are being obtained and there is at present every indication that this level of employment will be maintained for some time ahead.

The improved demand for castings from the machine-tool trade continues, but from collieries and railways the call is moderate. With the higher demand from the building industry and a steady call for supplies from the domestic utensil trade, many of the light foundries are fairly well employed. Overall, however, the work on hand is insufficient to occupy capacity fully, their mechanized plants being able to undertake a much larger flow of orders.

While most of the jobbing and textile foundries are also steadily engaged, more work is needed by them. From these foundries, together with the needs of some of the engineering foundries, the call for high phosphorus iron is at slightly higher levels. Producing furnaces are able to satisfy this without much difficulty and could increase these tonnages if the need arose. Parcels of high phosphorus pig-iron continue to be shipped overseas.

Producers of basic pig-iron are able to dispose fully of outputs to the steelworks, and the recent heavy demands for supplies has liquidated the stocks at the furnaces. The supply of basic pig-iron in some areas is inadequate, but the position is relieved by consignments which are being obtained from other home sources. The call for scrap by the steelworks is also heavy, but supplies are limited, necessitating a larger proportion of pig-iron in the melts.

Apart from the better and heavier grades of cast-iron and machinery scrap for which there is a strong demand, supplies for the ironfoundries are fairly plentiful. Coke deliveries are satisfactory and ganister, limestone, and firebricks are readily available.

Most of the re-rollers maintain a high level of outputs, although at many establishments production is affected adversely by the shortage of suitable labour and also by the scarcity of steel billets particularly in 2-in. size for rolling the smaller bars and sections. Demands for all their products are maintained at good levels, and in particular reinforcing rods are in heavy request.

Home steelworks continue to send forward appreciable quantities of steel semis, including billets, blooms and slabs. Stocks on hand at most of the re-rollers are small so that production is delayed pending receipt of suitable material from the producers. There is no difficulty in disposing of suitable defectives and crops as they arise at the steelworks.

Non-ferrous Metals

The recent strength of the London copper market is due in large part to professional activity by dealers covering short positions. What seems to have happened is that "bears" who had sold forward about the time the US strikes were ending (on the assumption that the price would fall) have now to meet their contracts and are finding it difficult to obtain cash metal to do so. Their concentration of demand on prompt metal has pushed up the price to well over £260 a ton, widened the backwardation to over £20 a ton, and focused attention on the shortage of available supplies of copper.

Certainly, prompt metal is in short supply both in consumers hands and in official LME warehouses. The price may well have been higher but for the easing of consumer interest in the holiday period and the falling away again of interest from the Continent.

Nevertheless, the breakdown of negotiations towards the end of last week over a new wage contract at Anaconda's El Salvador and Potrerillos mines in Chile is exercising a bullish influence on the market. This situation has intensified dealer-covering operations and could induce fresh demand into the market as, if no agreement is reached by April 20 over the wages agreement, the unions at the two mines can vote whether to come out on strike. The immediate outlook is, therefore, for a continuation of the present trend with the possibility of the London price going up to £270 a ton.

At present the US producers and custom smelters are quoting 33 cents a pound, equivalent to £264 a ton, so that the London quotation is not far off the point at which it will quite naturally draw metal from the other side of the Atlantic. In this connection it can be said that fairly large quantities of metal are arriving in this country from the States, but it is mainly electrolytic copper and it is not this type of which there is a severe shortage. Demand in the US continues patchy and, on the whole, disappointing. However, an assessment of economic conditions in the first quarter of 1960 suggests (to some economists at any rate) that business will get better as the months go by.

Tin is quiet in London and in New York and featureless in Singapore. Trading activity is slack in all three centres and prices have eased. The London price has been maintained around £788 a ton—probably by buffer stock activity. But the New York price has declined gradually and is now not far above 99 cents a pound.

Lead has been an active and basically firm market in London although price changes have been small. In the US demand is fair and the price is still called 12 cents a pound.

Zinc is quiet in London, although the shortage of nearby metal is noticeable and is reflected in the widening of the backwardation to around £3 a ton. It is reported that a great deal of high quality Russian zinc is coming into the country. However, only good ordinary brand zinc can be delivered to the London Metal Exchange so that the inflow of metal from the USSR is doing little to relieve the present shortage. In the US the market is steady and the price unchanged at 13 cents a pound.

LONDON FIRM of shiprepairers, Rye-Arc, Limited, has purchased the Nelson Dry Dock, Rotherhithe, and premises formerly owned by Mills & Knight, Limited, which recently ceased business. The dock is one of the oldest in London and it is understood that Rye-Arc is planning a considerable modernization programme.

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Current Prices of Iron, Steel, and Non-ferrous Metals

(*Delivered unless otherwise stated*)

April 20, 1960

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2, 10-ton lots or over: Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.40 per cent. P, 10-ton lots or over, £23 5s. 0d., delivered Birmingham, £23 10s. 0d., delivered Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 6s. 6d.; South Zone, £25 9s. 0d.

Refined Malleable.—P, 0.10 per cent. max.; North Zone, £26 6s. 6d.; South Zone, £26 9s. 0d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent., 10-ton lots or over: N.-E. of England (local iron), £23 19s. 0d.; Scotland (Scotch iron), Zone S.1, £24 5s. 6d.; Sheffield, £25 7s. 6d.; Birmingham, £25 14s. 0d.; Wales (Welsh iron), £23 19s. 0d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leicestershire in 10-ton lots or over.

FERRO-ALLOYS

(*Per ton unless otherwise stated, delivered*)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £41 10s. 0d. to £44 0s. 0d., scale 15s. 0d. per unit, lumpy; 75 per cent. Si, £57 0s. 0d. to £62 10s. 0d., scale 15s. 0d. per unit, lumpy.

Ferro-Vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s. 10d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 11s. 8d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 14s. 8d. per lb. of W.

Ferro-chrome (6-ton lots and over, lumpy).—4/6 per cent. C, £78 10s. 0d. to £82 10s. 0d., basis 60 per cent. Cr. scale 26s. 0d. to 28s. 6d. per unit; over 6 per cent. C, £77 0s. 0d. to £80 10s. 0d., basis 60 per cent. Cr, scale, 26s. 0d. to 28s. 6d. per unit; 2 per cent. C,* 1s. 8d. to 1s. 11d. per lb. Cr; 1 per cent, C,* 1s. 8½d. to 1s. 11½d. per lb. Cr; 0.15 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.10 per cent C,* 1s. 9¾d. to 2s. 0¾d. per lb. Cr; 0.06 per cent. C,* 1s. 10½d. to 2s. 1d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 6s. 10d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £275 0s. 0d.; 96/98 per cent., £285 0s. 0d.

Ferro-columbium.—65/67 per cent., Cb + Ta, 19s. 9d. per lb., Cb + Ta.

Ferro-manganese (Standard).—78 per cent., £63 10s. 0d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft u.t., 100 tons & over, £31 15s. 6d.; tested, 0.08 to 0.33 per cent. C, 6 to 35 tons, £33 15s. 6d.; hard (0.41 to 0.60 per cent. C), under 10 tons, £34 17s. 0d.; silico-manganese, under 10 tons, £43 16s. 6d.; free-cutting, under 10 tons, £36 14s. 6d. SIEMENS MARTIN ACID (under 10 tons): Up to 0.25 per cent. C, £41 1s. 0d.; silico-manganese, £44 4s. 0d.

Billets, Blooms, and Slabs for Forging and for Stamping (under 10 tons).—Basic, soft, up to 0.33 per cent. C, £38 10s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £39 12s. 6d.; acid, up to 0.25 per cent. C, £43 4s. 0d.

FINISHED STEEL

Heavy Plates and Sections (1 ton to 10 tons).—Ship plates (N.-E. Coast), £41 12s. 0d.; boiler plates (N.-E. Coast), £44 2s. 0d.; floor plates (N.-E. Coast), £43 10s. 0d.; angles (N.-E. Coast), £38 16s. 6d.; joists (N.-E. Coast), £38 12s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., and flats 5 in. wide and under, untested soft basic, 50 tons and over, £39 1s. 0d.; under 10 tons to 4 tons, £40 18s. 0d.; under 4 tons to 2 tons, £41 3s. 0d.; hoop and strip, coils, 100 tons and over, £38 0s. 0d.; uncoated strip mill coils, hot rolled, under 3 mm. to 12g., 25 tons to under 50 tons, £43 16s. 0d.; black sheets (hand mill), 24g., 10 tons and over, £57 14s. 6d.; galvanized corrugated sheets, 24g., 10 tons and over, £68 5s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £67 17s. 0d.; nickel-chrome, £98 11s. 0d.; nickel-chrome-molybdenum £111 4s. 0d., in lots of 5 tons to under 10 tons.

NON-FERROUS METALS

Copper.—Cash, £264 10s. 0d. to £265 0s. 0d.; three months, £245 10s. 0d. to £246 0s. 0d.; settlement, £265 0s. 0d.

Copper, Tubes, etc.—Solid-drawn tubes, 2s. 5½d. per lb.; rods, 275s. 0d. per cwt. basis; 20 s.w.g., 310s. 0d. per cwt.

Tin.—Cash, £787 10s. 0d. to £788 10s. 0d.; three months, £783 10s. 0d. to £784 0s. 0d.; settlement, £788 10s. 0d.

Lead (Refined Pig).—Second half April, £77 15s. 0d. to £77 17s. 6d.; second half July, £76 17s. 6d. to £77 0s. 0d.

Zinc.—Second half April, £92 0s. 0d. to £92 5s. 0d.; second half July, £89 5s. 0d. to £89 10s. 0d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £127 5s. 0d.; rolled zinc (boiler plates), all English destinations, £125 0s. 0d.; zinc oxide (Red Seal), d/d buyers' premises, £105 0s. 0d.

Brass Tubes, etc.—Solid-drawn tubes, 2s. 0¾d. per lb.; sheets to 10 w.g., 224s. 0d. per cwt.; wire, 2s. 10¾d.; rolled metal, 224s. 0d. per cwt.

Brass (Brazing).—BS1400, B3, £173; B6, £227.

Brass (High Tensile).—BS1400, HTB1, £203; HTB2, £225; HTB3, £237.

Gunmetal.—BS1400, LG2, £216; LG3, £223; G1, 1%, £284; G1, 1½%, £272.

Phosphor Bronze.—BS1400, PB1 (AID released), £315; BS1400, 90/10/1, £295.

Leaded Phosphor Bronze.—BS1400, LPB1, £237.

Phosphor Bronze Strip, etc.—Strip, 315s. 9d. per cwt.; wire, 4s. 3¾d. per lb.; rods, 3s. 6¾d.; tubes, 3s. 6¾d.; chill cast bars, solids 3s. 6¼d.; cored 3s. 7¼d. (CHARLES CLIFFORD, LIMITED).

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide x 0.056, 4s. 0d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 5d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 4s. 4d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 2½d. to 2s. 3d. per lb. Antimony, English, 99 per cent., £190 0s. 0d. Quicksilver, ex-warehouse, £70 10s. 0d. to £71 0s. 0d. Nickel, £600 0s. 0d. Aluminium, ingots, £186 0s. 0d.; aluminium bronze (BS1400), AB1, £258; AB2, £266.

* Average 68-70 per cent.

New Catalogues

Refractories. A spirally-bound, 12-page brochure received from Kingscliffe Super-Refractories, Limited, Sandiron House, Beauchief, Sheffield, 8, gives the chemical composition, mechanical analysis (using B.S.S., A.F.S., and D.I.N. (German) sieves) and refractoriness—together with melting points—of their brands of fireclays, ganisters and other plastic refractories. Purchasing agents should welcome this brochure for its technical content.

Gravity Conveyors. Cleverly adapting the falling-apple theory of Newton, Rownsons (Conveyors), Limited, Maiden Lane, York Way, London, N.7, have used a folder to detail the types of roller conveyors they make, and to record illustrated descriptions of some of the component parts. This year, the company celebrates the 50th anniversary of its establishment.

Vitreous-enamelling Equipment. In Publication No. M. 10A, Metalectric Furnaces, Limited, Cornwall Road, Smethwick, 40, outline the general equipment and services they offer to makers of vitreous-enamelled ware, and draw particular attention to electrically-fired batch and continuous types of fusing-furnaces. For the jewellery trade, a quite small continuous furnace is described.

TECHNICAL SALES organization has been formed by Hardy Spicer, Limited, Birmingham, and Jean Walterscheid, KG, of Germany. It will be known as Hardy Spicer-Walterscheid, and will be responsible for marketing in the UK, Commonwealth, and certain other overseas territories, range of agricultural products.

Alfred Herbert's New Machines

Several new machines added to the range of manufactures of Alfred Herbert, Limited, machine-tool makers, of Coventry, during the year to October 31, 1959, met with immediate success, states the chairman, Col. C. W. Clark. He says that the company's present problem is to comply with the demand for these machines and certain other models enjoying an established popularity. The demand for the company's goods is such that there should be no difficulty in repeating the ordinary dividend of the previous year.

Expansion continues on the Atritor drying and pulverizing machines' side of the business, making a very useful contribution to the company's profits. Associated companies in Australia, France, and Italy continue to make satisfactory profits in view of the restricted imports which until recently limited their turnover. The position in these countries has now improved.

Group net profit for 1958-59 fell from £1,585,041 to £1,366,342, but the dividend is raised by 1 per cent. to 7 per cent., tax free, in view of the improved position. A capital bonus of ½ per cent. was also paid.

International Foundry Congress, 1960

In connection with the International Foundry Congress to be held in Zurich, Switzerland, from September 18 to 24, a Congress brochure has now been published and copies are obtainable from the secretary of the Institute of British Foundrymen, 14 Pall Mall, London, S.W.1. Those wishing to participate in the event are asked to register with the secretary as soon as possible. (Brief details of the programme were published in the JOURNAL, October 29 issue).

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Advertisements (accompanied by a remittance) and replies to Box Numbers should be addressed to the Advertisement Manager, Foundry Trade Journal, John Adam House 17/19, John Adam Street, Adelphi, London, W.C.2. If received by first post Monday advertisements can normally be accommodated in the following Thursday's issue.

SITUATIONS WANTED

TECHNICAL REPRESENTATIVE with practical experience and extensive connection in London and Home Counties, wishes to represent a Foundry for cast iron non-ferrous die-castings, etc. A good personal connection. Commission and part expenses. Box TR522, FOUNDRY TRADE JOURNAL.

FOUNDRYMAN, 34, nine years' experience all aspects lost wax castings, shell and block moulds, also development work, accustomed supervising labour, seeks similar position. Box FT583, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

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A LARGE South African foundry is commencing the production of gravity die-cast brass fittings and requires the services of a competent and experienced FOUNDRYMAN to take control of the new department. Apply, giving fullest details, to:

CITY ENGINEERING & CARRON LTD.
P.O. Box 210,
Pretoria, Union of South Africa.

FOUNDRY FOREMAN required for Non-ferrous Jobbing Foundry. Must be practical man and have held similar position. State full history and salary required. Box FO557, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN required for Ferrous Castings Foundry situated in the West Riding of Yorkshire. Weekly output 100 tons per week on Mechanised and Semi-mechanised Plants. Must have experience in Machine Moulding and Sand Control, and be able to control semi-skilled labour. Staff appointment for capable person. Pension Scheme, canteen facilities. Accommodation available. Please send details, giving age, experience, qualifications and salary, to Box FF563, FOUNDRY TRADE JOURNAL.

FOREMAN REQUIRED for non-ferrous foundry in North-West London. Reply in writing to Box FR564, FOUNDRY TRADE JOURNAL.

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Applications, stating age, qualifications and experience to BOX AN547, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—*contd.*

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The Company produces blackheart, malleable and grey irons to specifications, and the duties of the successful applicant will be to supply technical advice to cover frequently changing conditions and problems.

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The salary will be attractive to the right man who will have excellent prospects for advancement to a senior Management position.

Personal Assistance
The successful applicant will be sponsored by the Company under the assisted migration scheme and a house will be provided at a nominal rental for a reasonable period of time.

Those interested should apply, stating age, qualifications and details of experience to:—

W. D. SCOTT & CO. LTD.
Management Consultants, 12 Thayer Street, London, W.1.

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Box No. FF523, FOUNDRY TRADE JOURNAL

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Please send brief details in confidence, quoting reference GT.2336, to D. J. Clarkson. In no circumstances will a candidate's identity be disclosed to our client unless he gives permission after a confidential interview at which he will be given full details of the appointment.

MANAGEMENT SELECTION LIMITED, 17, Stratton Street, London, W.1.

SITUATIONS VACANT—*contd.*

WANTED. Floor and Bench MOULDERS, experienced in non-ferrous and light alloy specifications for jobbing foundry. Apply: STARLING FOUNDRIES LTD., 46, Pitlake, Croydon.

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Catalogues (when ready) may be obtained of: Messrs. HENRY BUTCHER & CO., Auctioneers, Valuers and Surveyors of Factories, Plant and Equipment, 73, Chancery Lane, London, W.C.2. Telephone: (HOLborn 8411 8 lines).

MACHINERY WANTED

1½ G. "Reed Prentice" and "Edgwick" A.1611 Cold Chamber Die-casting Machines required for aluminium. Box MW586, FOUNDRY TRADE JOURNAL.

WANTED in good condition: Core-blowers, Type R.2 and R.4. Box WA549, FOUNDRY TRADE JOURNAL.

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FOR SALE.—Abrasive Wheel Cutoff Machine, Coleman CA type, complete with spares and electrical equipment. A.C., 400/440 v. standard, and in as new condition. Box FS581, FOUNDRY TRADE JOURNAL.

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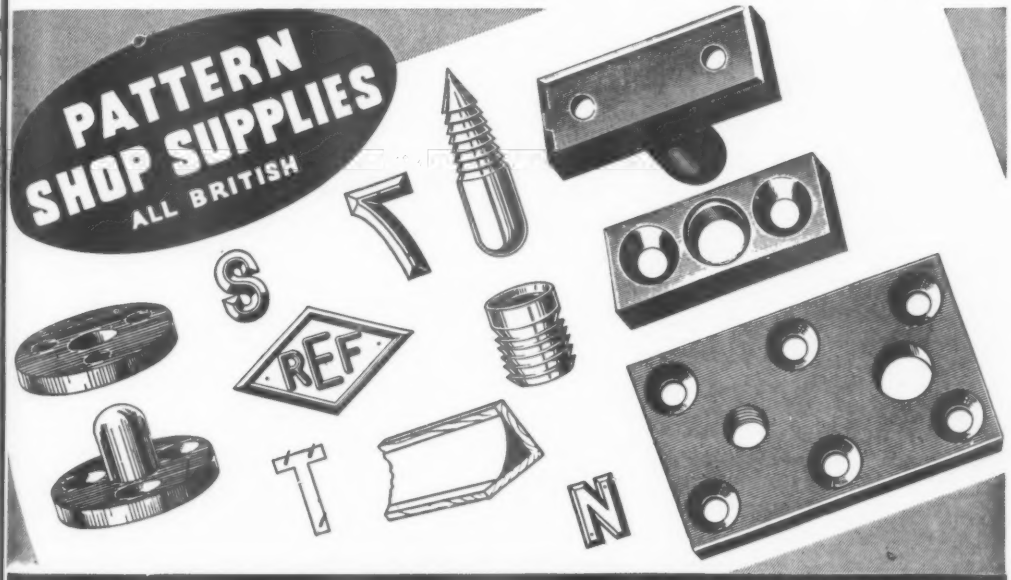

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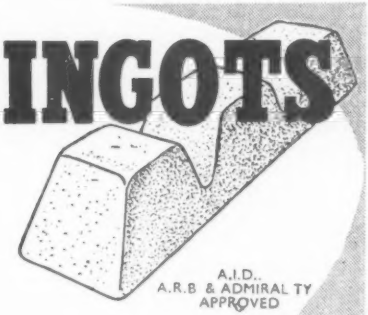

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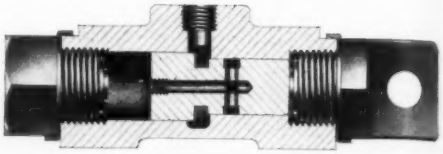

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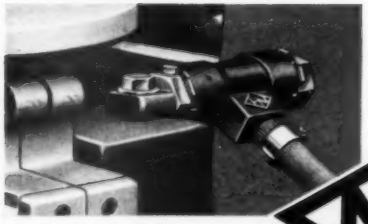

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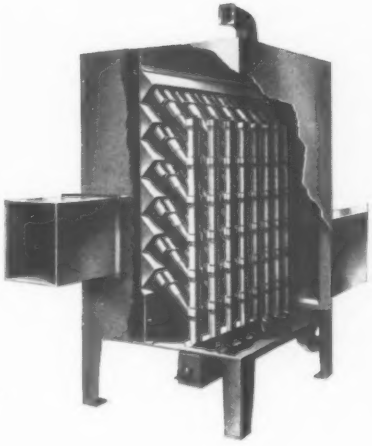

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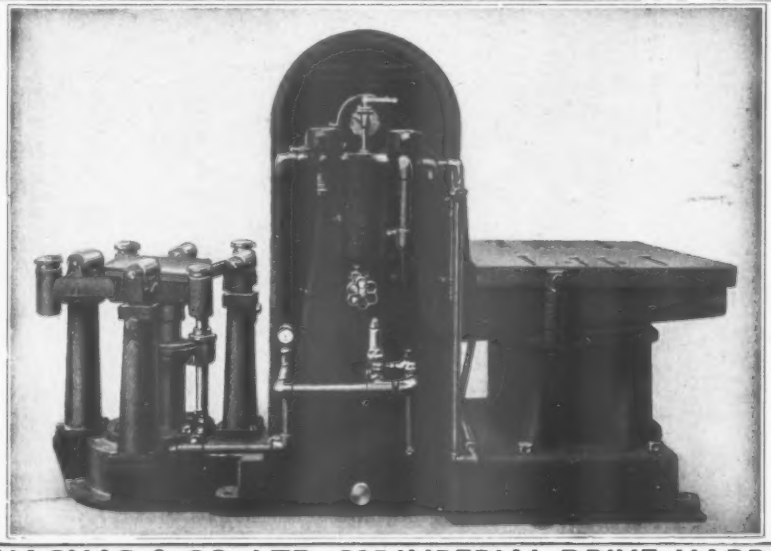

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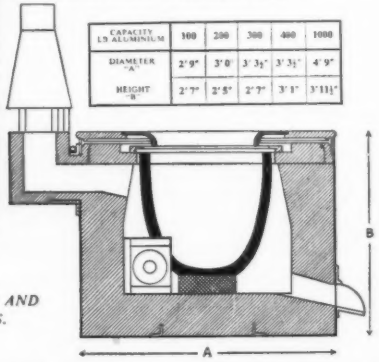

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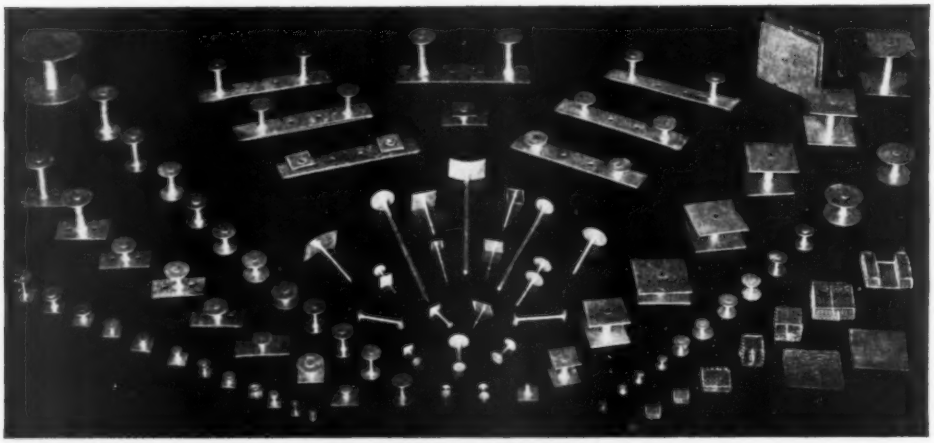

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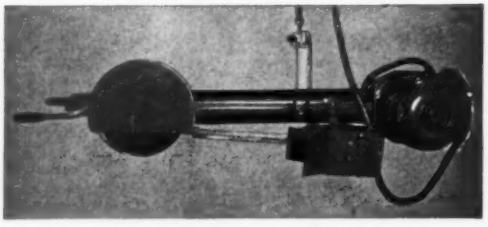

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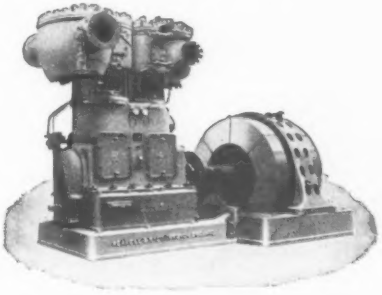

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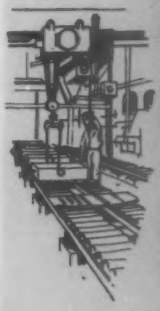

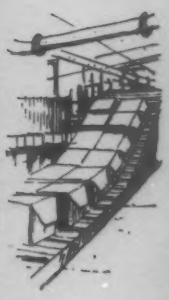

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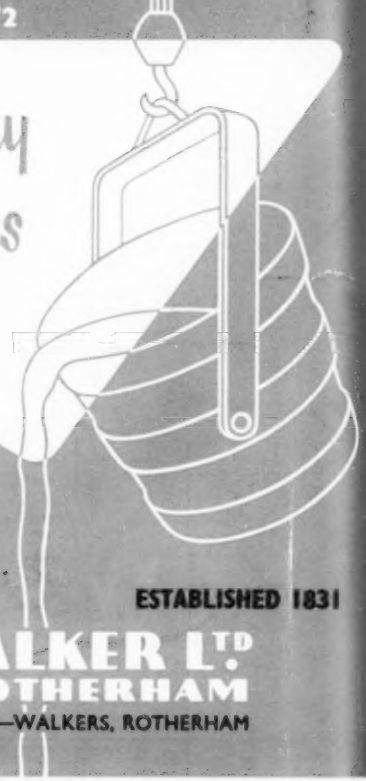

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